

**4+** publication



# Hawker Sea Hawk

**F.1, 2, FB.3, 5, FGA.4, 6, 50, 100, FGA/RR.101**

post-war wings  
line  
1/72 scale plan



4+ publication



## Hawker Sea Hawk

1:1, 2, 3, 5, 6, 8, 10, 16, 24, 32, 48, 64, 96, 128, 192, 256, 384, 512, 768, 1024

post-war wings  
line

### Front cover photo:

With its wings folded in butterfly fashion a Sea Hawk FGA Mk.6, WV908/188-A(ex-'641-LM'), sits on an apron at RNAS Yeovilton. In 1982 it joined the Royal Navy Historic Flight and after restoration it displayed No.806 Squadron colours with well-known 'Ace of Diamonds' insignia on fuselage sides.

Photo Bob Turner

### Rear cover photo:

An ex-FAA Sea Hawk FGA Mk.6, IN184, refurbished for sale to the Indian Navy. It still retains the overall black livery of the former user, the Airwork Services Ltd., which flew the aircraft under its original Royal Navy identity XE394. The photo was taken at RAF Sharjah, Sharjah Emirate, in 1963.

Photo Ray Deacon

## ACKNOWLEDGEMENTS

The publishers gratefully acknowledge the co-operation of:

Chris Charland, Ray Deacon, Jagan P.V.S. Mohan – Bharat Rakshak, Eric Quenardel, Erwin J.W. Stam

A word of thanks is also extended to:

Keith Dexter, Stan Dudek, Lee Howard, E.G. Hayward, Roger T. Jackson, Dianne James & Midland Air Museum staff, Mick Jennings, Leo Julien, S.C.P. Kreuger, Philippe Mesureux, Nadezda Niklova-Thiel, Bruce Robertson, Andy Robinson & IWM Duxford Conservation Department staff, Mark Russell, Scotland Museum of Flight staff, Jerry R. Shore, Bob Turner, Siegfried Wache, Simon Watson, Ray Williams, Brian Wood and Daniel Dryden - British Academy Aracena.

The appropriately credited photographs are used with the permission of The Trustees of the Imperial War Museum, London.

## CONTRIBUTORS AND SOURCES

Ray Deacon, Philippe Mesureux, Nadezda Niklova-Thiel, Eric Quenardel, Bruce Robertson, Miłosz Rusiecki, Erwin J.W. Stam, SUN via Stan Dudek, N.F.L. Terlouw - Airview, Bob Turner, Siegfried Wache - AGL.

FAA Museum Yeovilton, FAA Museum Records and Research Centre, IWM Duxford, IWM - Department of Photographs, Aircraft Museum - Southend Airport, Flambards Village Theme Park - Cornwall Aero Park Helston, Internationales Luftfahrtmuseum Manfred Pflumm - Villingen-Schwenningen, Midland Air Museum, Militaire Luchtvaart Museum Soesterberg, Newark Air Museum, RAF Museum Hendon, Scotland Museum of Flight - East Fortune, The A.J. Jackson Collection, NTM Archives Prague, RCAF Winter Experimental Establishment Flight files, MARK I archive

## COPYRIGHT © 2001 by MARK I Ltd.

All rights reserved. No part of this publication may be reproduced nor copied in any form electronic, electrical, chemical, mechanical, optical, photocopying or otherwise, without prior written permission of the publishers.

## THE AUTHORS' WORD

Dear reader,

Thank you for your buying another publication with the 4+ trademark. We introduce this publication as the first of the *Post-war Wings Line*. New titles in other *Wings Lines* are currently being prepared. This time we have focused on a fairly neglected jet aeroplane and we hope you will enjoy the monograph and appreciate many previously unpublished materials.

### 4+ publications already published:

MiG-21 Fishbed  
Su-22 Fitter (out of print)  
Mi-24 Hind (out of print)  
MiG-23 Flogger fighter variants  
MiG-29 Fulcrum  
Su-25 Frogfoot  
MiG-15 Fagot

### 4+ publication published in Rotary Wings Line:

Westland Wessex

### 4+ publications published in World War II Wings Line:

Westland Lysander  
Hawker Tempest  
Miles Magister

## Hawker Sea Hawk publication

Authors of the text - Michal Ovcacik, Karel Susa

Photos (unless otherwise stated) - Michal Ovcacik, Bruce Robertson, Karel Susa, MARK I archive

Plans and drawings - Michal Ovcacik, Karel Susa, MARK I archive

Camouflage drawings - DDAir Computergraphics, Stan Dudek and MARK I archive

Litho - Art-D, Grafický atelier Cerný Ltd., Prague 10, Czech Republic

Printed by TRICO Ltd., Prague 7, Czech Republic

4+ is a ® registered trademark

Published by MARK I Ltd., PO Box 10, 100 31 Prague 10 - Stranice, Czech Republic  
© MARK I Ltd., 1st edition, Prague 2001

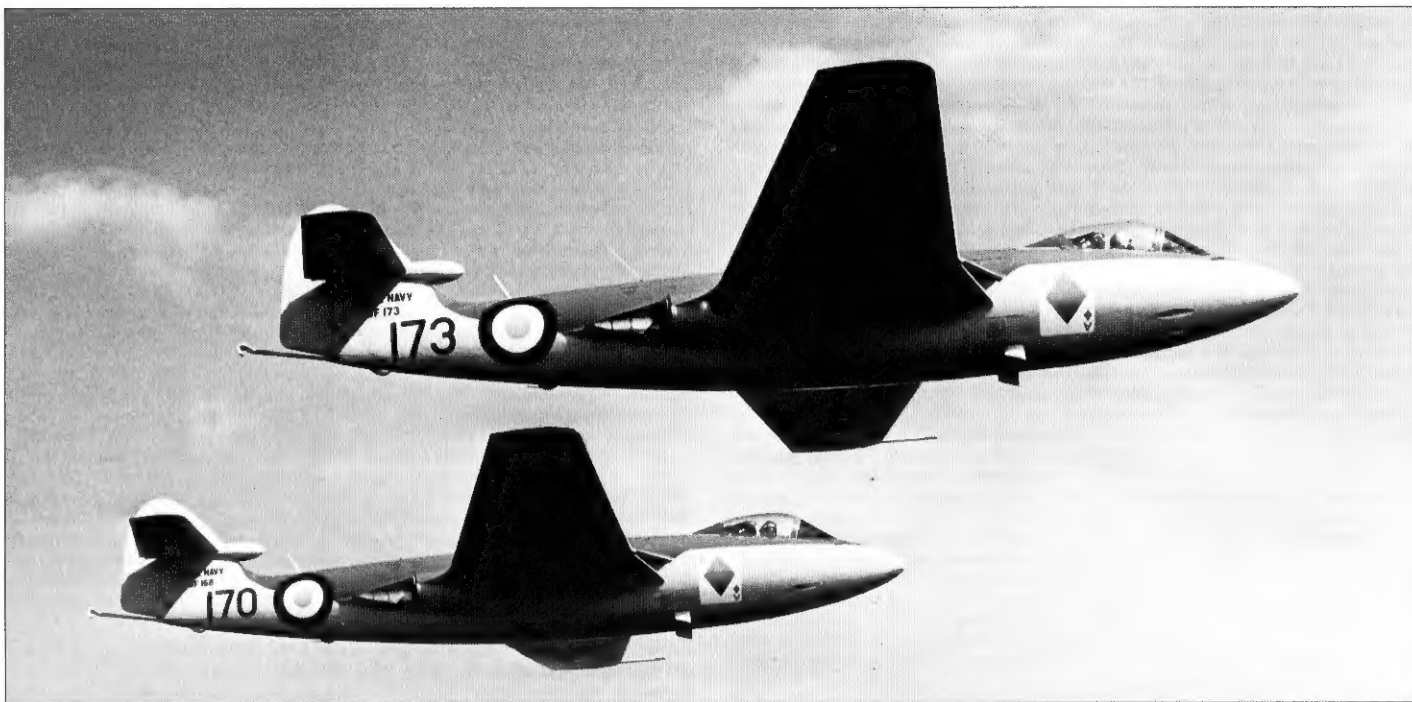
ISBN 80-902559-3-0

If not available in your area and/or for more information on 4+ publications, write to:

**MARK I Ltd.**  
PO Box 10  
100 31 Prague 10 - Stranice  
CZECH REPUBLIC

You can also e-mail us at:  
**mark1@cmail.cz**





Flying abreast is this pair of Sea Hawk F Mk.1s, WF173/173 and WF168/170, of No.806 'Ace of Diamonds' Squadron. This unit was the first FAA squadron to take on Sea Hawks in March 1953, being at that time shore-based at RNAS Brawdy.

## Hawker Sea Hawk, the history and summary

The Jet Age started to seriously occupy the drawing boards at the Kingston offices of the Hawker Aircraft Ltd. as soon as a reliable and powerful jet propulsion engine came into existence. Such a unit had been designed by the Rolls-Royce team at Barnoldswick and, in the guise of the RB.41 Nene, it was first fired up in late October 1944. At that time the company's preoccupation lay in the development of the Tempest and Sea Fury radial piston-engined fighters and production of the Tempest was also in full swing. A preliminary P.1035 project was based on the F.2/43 Fury fighter with the new powerplant mounted in the fuselage, amidships behind the pilot, but in December 1944 a more advanced concept evolved. The engine air intakes had been relocated from the nose to the wing roots and the patented split jet pipes exhausted in the fuselage sides behind the wing trailing edges. This proposal, mastered by the firm's Chief Designer Sydney Camm, was conceived as a land-based interceptor and, designated the P.1040, it was submitted to the Ministry of Aircraft Production in February 1945. At this point the Admiralty became involved in seeking out a successor to the Sea Fury and a contender for the Attacker jet aeroplane. Several naval projects, including the P.1045 and P.1046, were schemed, but with radically reduced Research & Development expenditure after the end of WWII they were shelved and even the original P.1040 tender was suspended as far as Air Staff interest was concerned. The RAF already possessed the Meteor and the Vampire jet fighters, both offering some development prospects, and thus no need for a new machine was forthcoming. To revive interest a P.1040-related design study was submitted in October 1945 under the designation P.1047. A swept-back wing configuration and rocket power was offered, but eventually, in 1948, the aircraft appeared without the rocket engine as the P.1052 research aircraft. Regarding the Royal Navy's attitude to the P.1040 their support persevered and better still resulted in a new Hawker tender in January 1946. Specification N.7/46 was drawn up four months later by the Air Ministry and an order was placed for one test airframe, one prototype aerodynamically representative of the fighter (covering the firm's private venture) and two navalised prototypes. The aircraft was designed using an all-metal stressed-skin construction with the powerplant located centrally in a cigar-shaped fuselage. The pilot's cockpit was placed in the nose and its bubble canopy secured an all-round view. The use of split air intakes and bifurcated jet pipes incorporated in stub wings allowed for the adoption of a thin wing of a constant thickness-to-chord ratio of 9.5%. A Hawker high speed aerofoil section with 0.5% camber at 40% chord was utilised, the wing having a moderate taper and an aspect ratio of 5.47. Conventional tail surfaces were employed, with raised tailplanes ensuring that they were not affected by the exhaust effluxion. A tricycle nosewheel undercarriage was adopted, which retracted into the fuselage nose and centre section.

The first flying prototype, the VP401, was produced at the Kingston factory with its final assembly at Langley in late summer 1947. The first taxiing was conducted by Test Pilot W. Humble at the adjacent grassy aerodrome, but it was found to be unsuited for the flight testing of turbojet-powered aircraft. So, after the P.1040 had been transported to A&AEE at Boscombe Down, it was flown for the first time on 2 September and, after yet another transfer to the RAE Farnborough, it continued its test flying. The aeroplane was powered by an early production 4,500 lb st (20,02 kN) Nene I and equipped with an unpressurised cockpit and non-ejection pilot's seat. It featured non-folding wings without airbrakes and pneumatic-type wheel brakes and at that moment neither an arrest hook nor any armament was fitted. Early flying revealed minor vibration and noise distinctions, rectified by exchanging the rectangular exhaust heat fairings for triangular ones and by the addition of a bullet fairing at the tailplane-fin intersection. The P.1040 was used for research work, but in the summer of 1949 it was released to take part in the National Air Races at Elmdon. Fitted with a new Nene II engine of 5,000 lb (22,24 kN) static thrust it eventually won three Trophies. In September it was returned to the manufacturer for reconfiguration as the P.1072 with an Armstrong Siddeley Snarler rocket motor. Two true naval N.7/46 prototypes, the VP413 and VP422, joined the team in August 1948 and October the following year respectively. Both aircraft had Nene II engines and featured folding wings, hydraulic wheel brakes, full naval equipment and a four-gun armament. The cockpit canopy was redesigned with the original single-piece curved windscreen replaced by a three-piece unit with a flat centre panel, which eliminated forward sighting distortion. After initial tests and airfield dummy deck landings at Boscombe Down the VP413 went aboard the carrier HMS Illustrious

in April 1949 to conduct deck landing and general handling trials. As a result the wing span was increased by 30" and a lengthened arrest hook was fitted in July. These improvements were incorporated in the other prototype the VP422, which also had provision for RATO gear and underwing drop tanks and had an improved undercarriage retraction system. As the airbrake installation was not yet fixed, both prototypes were used for trials of alternative dive brake schemes. Eventually split trailing edge flaps were adopted, whose lower surfaces also acted as landing/take-off flaps, and in the stub wing undersurface dive recovery flaps were installed.

On completion of the prototype development programme the Ministry of Supply contracted the Hawker Aircraft Ltd. on 22 November, 1949, to produce a series of 151 naval interceptors to be named the Sea Hawk. Soon it became obvious that development and production of another Hawker P.1067 project, later becoming the Hunter, would prejudice the manufacture of the Sea Hawk as there was not enough space at Kingston and Langley to run the large-scale production of two aeroplanes simultaneously. Therefore suitable production facilities had to be found within the Hawker-Siddeley Group and the Coventry-based Sir W.G. Armstrong Whitworth Aircraft Ltd. company was chosen.

**Sea Hawk F Mk.1** production, switched to Hawkers in 1951, was terminated there after the 35th machine had been built. During autumn of that year the entire production and development was put in the hands of the Armstrong Whitworths. Another 60 Sea Hawks of the same Mark were built at the Baginton workshops and assembled and flown from the Bitteswell aerodrome with the first aircraft off the production line before the end of 1952. Both HAL and AWA contracts were the subject of a 'Super Priority' ministerial order, which speeded up production and secured supplies of indispensable materials and components. The Mark 1 aircraft were basically the same as the prototype VP422 with a Nene 4 (Mk.101) engine with the same power output as its predecessor. The windscreen and cockpit hood finally received their ultimate shape and a Martin-Baker ejection seat was installed in the unpressurised cockpit provided with heating and cooling. Later in production a fin bullet-shaped fairing was introduced as a standard feature. Many Hawker-built machines (WF143 - 161, 167 - 177 and WM901 - 905) were engaged in various service trials, including the fuel system, RATO, engine and radio installation tests, gun firing and bombing trials. The WF148 was sent overseas to take part in cold weather experiments during winter 1952/53; these trials were conducted by the Winter Experimental Establishment Flight at Fort Churchill, Manitoba, a detachment of the RCAF's Central Experimental & Proving Establishment. The WF144 and WF145 were used for carrier deck landing/take-off trials aboard HMS Eagle in 1952. A power assisted aileron system, improving the lateral control of the aircraft, was first fitted and tested on the fifth production Sea Hawk, the WF147, which in this guise represented the prototype of the second series aircraft.

The first unit to take on the new fighter was No.703 Squadron, a Service Trials Unit based at Ford, which received nine aircraft in September 1952. Six months later the first operational unit, No.806 'Ace of Diamonds' Squadron, was formed at Brawdy. Other squadrons to receive the F Mk.1s were Nos.804 and 898 aboard HMS Bulwark and HMS Albion respectively, No.767 Landing Signal Officers Training Squadron at Stretton, Nos.738 and 736 Sq. at Lossiemouth (a part of the Naval Air Fighter School) and No.764 Sq. (an Advanced Training Squadron later reforming as the Fighter Pilot Holding Unit) based at Yeovilton and then at Ford. Two other units, Nos.1832 and 1836 of the RN Volunteer Reserve, also flew the aircraft for a short period of time during 1956-57.

**Sea Hawk F Mk.2** represented a sub-variant, of which only forty were built, with cockpit pressurization, power assisted aileron control and an artificial spring feel and centring unit. This installation remedied the Mk.1 aileron oscillation causing the loss of lateral control at high speeds. The first aircraft were completed by the end of February 1954 and then successively issued mainly to Nos.802 and 807 Squadrons, although later they were also supplied to Nos.736, 738, 764 and 767 Sq. A handful of aircraft was retained for testing, of which one, the WF243, was fitted with an uprated Nene Mk.103 engine and thus became a prototype for the Mark 5 version. Both F.1 and F.2s were phased out from front-line service during 1954.

**Sea Hawk FB Mk.3** was a result of the modification of the F.2 for a fighter-bomber role. The scheme had been tested on two Mark 1 aircraft, the WF187 and WF218, with provision for the carriage of bombs or mines in place of the drop tanks under the stub wing pylons. The FB.3 featured the Nene RN.4 (Mk.101) powerplant, powered ailerons, a fully pressurised cockpit and modified fuel system. As an alternative to previous types of me-

tail-jetisonable tanks plastic drop tanks could be used. By mid-March 1954 the first Mark 3 was built and test flown, followed by another 115 aircraft during that year. This type became the most widely-used Sea Hawk in service with the FAA, ultimately equipping 9 first-line units and 7 support squadrons. The first was No. 787 (Naval Air Fighting Development Unit at West Raynham), which received the FB.3 as early as April 1954, while the first operational units converting to the type were Nos. 806, 898, 803, 800 and 807 (in order of delivery). Many aircraft within the '800'-range squadrons went to sea aboard HMS Eagle, Albion, Centaur, Bulwark and Ark Royal. Later, in 1955, some FB Mk.3s went also to No. 700 Sq. at Ford, which served as the Trials and Requirements Unit. Two aircraft, the WF280 and 294, were modified to carry ground support loads (4x 500lb bombs and 20x 3" RPs respectively) on additional wing strong points representing the next and definitive Sea Hawk variant, the FGA Mk.4. Other Mk.3 aeroplanes were used for radio and controls trials and yet another, the WM914, was test equipped for naval reconnaissance duties by fitting forward-facing cameras into the drop tanks.

**Sea Hawk FGA Mk.4**, a ground attack fighter, could carry stores either on four underwing pylons or rocket projectiles on ten launchers or a combination of both. With the same engine employed, bigger loads had a detrimental effect on the aircraft's performance. However, production had already begun and the first FGA.4 was put in the air in August 1954. In total 97 machines were produced. The first operational units to be equipped by the end of the year included Nos. 802 and 804 Sq., while another seven took on the FGA.4s the following year and the last No. 895 Sq. in April 1956.

**Sea Hawk FB Mk.5** was a conversion of the FB.3 incorporating the more powerful Nene RN.6 (Mk.103) engine. No new FB.5s as such were produced and only about four dozen machines were reconfigured in 1955. After conversion they resumed service within their original squadrons.

**Sea Hawk FGA Mk.6** evolved as an analogous FGA.4 upgrade with the Nene Mk.103 unit, of which some 30 were made. As a supplement, early in 1955, an order for 95 new-build Mark 6 aircraft was placed by the MAP, but eventually only 87 were finished by January 1956. The first unit to receive them was No. 800 Sq. in June 1955, while the last No. 806 Sq. converted to the type three years later. As with all previous Marks, the FGA.6 was seconded to non-operational units, including No. 700 TRU, which later handed over some of its tasks and aircraft to the Airwork-operated Fleet Requirements Unit at Hurn.

During the Suez campaign in November 1956 the Sea Hawks saw combat as part of 'Operation Musketeer'. The squadrons involved were embarked in HMS Albion (No. 800 Sq. FGA.6s, No. 802 Sq. FB.3s and No. 810 Sq. FGA.4 and 6s), HMS Bulwark (No. 804 Sq. FGA.6s, No. 895 Sq. FB.3s and No. 897 Sq. FGA.4 and 6s) and HMS Eagle (No. 899 Sq. FGA.6s). They attacked Egyptian airfields and provided air support for ground forces. A good deal of publicity was given by Sea Hawk aerobatic teams, the first being established within No. 804 Sq. in 1954 and later revived by No. 738 Sq. aircraft. Its 'Red Devils' team performed during the SBAC Display at Farnborough in 1957 and the tradition was still held in the early sixties. By that time, however, Sea Hawks were being replaced by new Scimitar and Sea Vixen fighters. The last first-line unit relinquished the FGA.6s in December 1960, while No. 781 Communications Sq. used its XE390 until May 1967.

In September 1959 the Indian Government negotiated the purchase of Sea Hawks for their naval air arm, the INA. By June the following year 9 aircraft (a mixed batch of FB.3 and FGA.6s) formed the nucleus of No. 300 INAS 'White Tigers' while the other 14 new FGA.6s were supplied in 1960-61 (being the very last Sea Hawks built) and a further batch of 22 refurbished FGA.4/6s followed afterwards. Conversion and training was provided by No. 551 INAS at Dabolim, while other aircraft operated from INS Vikrant, the only Indian Navy carrier. Sea Hawks took an active part in 'Operation Vijay' in December 1961 and in both Indo-Pakistani conflicts in September 1965 and in December 1971. The last INA Sea Hawks were retired by the end of 1983.

**Sea Hawk FGA Mk.50** was the first export version, ordered in 1956 for service with the Dutch Marine Luchtvaart Dienst. 22 aircraft similar to the FGA.6 of the FAA were delivered between July 1957 and January 1958; one FGA Mk.6, the XE369, had been used as a master. FGA.50s entered service with No. 860 Sq. at Valkenburg in September 1957 with a detachment of the unit deploying on HNLMS Karel Doorman, the sole Dutch carrier. No. 860 Sq. also formed a demonstration team called 'The Sealords'. The only other MLD unit to operate the type was No. 3 Sq., a fighter pilot training squadron in commission until June 1961. During 1959 the Dutch Sea Hawks were modernised to carry two Sidewinder missiles on outer wing pylons. The MLD withdrew its FGA.50s by 31 December, 1964, and the aircraft were scrapped.

**Sea Hawk FGA Mk.100 and FGA/RR Mk.101** were special versions designed for the Federal German Republic's 'Marinefliegerverbände der Bundesmarine'. A plan for two versions, the Mk.100 fair-weather day fighter-bomber and the Mk.101 bad-weather day fighter, was worked out in 1955 with an ensuing order for 34 machines of each variant. Their development took some time and one Mk.6 aircraft, the XE456, was used as a test bed. Both Marks had extra fin and rudder area added to improve lateral stability and a radio installation was changed. The Mk.100s equipped MFG 1 (VA-coded aircraft) and MFG 2 (VB codes) at Schleswig-Jagel airfield in July 1958 after the training of the personnel had been made at RNAS Lossiemouth earlier that year. The majority of the aircraft was sent to Bremen to be assembled and test flown at the Focke-Wulf factory. Mk.101 delivery was delayed until April 1959 and equally split between the two units (RB2-coded aircraft going to MFG 1). Sea Hawks were in operational use by MFG 1 until mid-1965, while MFG 2 retained them till the end of 1966. In June of that year 10 Mk.100 and 18 Mk.101 aircraft were despatched to India to supplement the previously delivered FGA.6s.

In the late 1950s the Royal Australian Navy intended to acquire Hawker Sea Hawks for service on the carriers HMAS Sydney and HMAS Melbourne. However, it was later found that it would not be possible to operate the aircraft from those carriers, contrary to original advice from the Admiralty. Therefore no order materialised and the type did not see service with the RAN.

The Sea Hawk gave an invaluable service, especially with regards to its ground support capabilities, and it was easy to control and maintain, which made it popular among pilots and personnel. As far as the concept is concerned, its singularity was proved by the fact that it was kept in Royal Navy front-line service for 7 years and even longer in the hands of overseas users. ■

#### List of abbreviations

ADF	Automatic Direction-Finding
ASR	Air Search Radar
AWA	Sir W.G. Armstrong Whitworth Aircraft Co. Ltd.
Ekco	E.K. Cole Ltd.
FB	Fighter-Bomber
FGA	Fighter Ground Attack
FRU	Fleet Requirements Unit
GGs	Gyro gunsight
GP	General Purpose
HAL	Hawker Aircraft Ltd.
INA	Indian Naval Aviation
MC	Medium Capacity
RATOG	Rocket-assisted take-off gear
RP	Rocket Projectile
RR	Radar Reconnaissance
SBAC	Society of British Aircraft Constructors
TRU	Trials and Requirements Unit

## Technical description of Hawker Sea Hawk Mk.1, 2, 3/5, 4/6, 50, 100 & 101

The Sea Hawk was a single-seat single-engine mid-wing interceptor fighter with a retractable undercarriage, a sting-type arrestor hook and folding wings. It was designed specifically for use on aircraft carriers and naval shore-based stations. Later Marks could be equipped for a close-support role and target-towing.

**The fuselage**, of all-metal construction, is of sound aerodynamic form, the cross section being circular over the nose and centre portions, gradually changing to elliptical aft of the jet pipes. It consists of three main parts – front, centre and rear. The former two are of monocoque construction reinforced by a keel member and four longerons, while the rear fuselage, incorporating the lower part of the fin, has a pure monocoque structure. The fuselage nose is occupied by a nose wheel bay, the refrigeration assembly of the air conditioning system, a cine camera and ballast weights. This portion is attached to the 15-frame front fuselage, which accommodates the cockpit, two forward fuel tanks and ammunition box bays and the front gun bay below the cockpit floor. The cockpit, fitted with an Martin-Baker Mk.2 ejection seat, is enclosed by a three-panel windscreen and a single-piece aft sliding aerodynamic Perspex hood. The windscreen has a fixed frame with two curved Triplex glass side panels and a centre panel made of flat bullet-proof Triplex glass and cover glass. The hood, normally sliding on rollers, can be jettisoned in an emergency. In the bottom the box-sectioned keel member houses a retractable accelerated take-off hook. The centre fuselage extends from forward frame No. 12A aft to frame No. 28, which function as the transport joints. The inner sections of the wing spars are integral with the centre fuselage and form stub wings with air intakes situated in the leading edges and jet exhausts in the trailing edges adjacent to the fuselage. The inner portions of the wing flaps are on the lower surface and the main undercarriage bays occupy the bottom of the centre section. Frame Nos. 17 and 22 constitute the front and rear spars of the stub wings respectively, and are of heavy construction, the former frame being also fireproofed. The plenum chamber, which houses the engine, is located aft of frame No. 14. Just forward of it are the engine accessories gearbox, cartridge starter, fuel pumps and other installations; both compartments are covered by detachable panels. Below the air intakes are the rear gun bays, accessible through the doors on each side. The two rear fuel tanks are located between frame Nos. 17 and 28, the forward one being the saddle tank above the rear of the engine and the rear one is shaped to fit between the split jet pipes. The rear fuselage consists of 16 frames and stringers. Its forward section, between frame Nos. 29 and 31, houses radio and navigation equipment and mountings for reconnaissance cameras. The three endmost frames are extended to form the lower portion of the fin. A diaphragm and fittings are provided for tailplane attachment. In the bottom is the housing for the arrestor hook, which is pivoted at frame No. 37.

**The tail surfaces** consist of a single fin and tailplane of multi-spar construction. The one-piece vertical plane (of an H.9.36% Sym. Mod. aerofoil section) and interconnected elevators with trim tabs are mounted midway up the fin, clear of the jet blast and wing wake. The tailplane acorn fairing, installed during Mk.1 production, improves control and stability. The unbalanced rudder, with an adjustable trim tab, is hinged on the extensions aft of frame No. 40. On Mk.100/101 aircraft the vertical tail surface is increased by 12.6%.

**The wings** are unswept, of a trapezoid plan form, with blunt tips. The Hawker H.054010/37 Mod. high speed aerofoil section, with a taper ratio of 9.5%, is used. The two-spar wings of stressed-skin construction are attached to the fuselage stub wings by hinge pins; the folding joints are just outboard of the air intakes. The power-folded outer wings are covered by heavy gauge skin giving a smooth finish and necessary torsional stiffness. The outer portion of lower flaps and upper surface flaps extend from the folding junction to the ailerons. Both flaps are linked together to act as airbrakes, but the lower surfaces operate independently when used as take-off and landing flaps. Mark 1 aircraft are provided with manually operated spring tab ailerons, while Mk.2 and later aircraft have power assisted ailerons; the trim tabs are fitted only to the port ailerons.

**The lighting gear** comprises a tricycle-type undercarriage and a deck arrestor hook. The main undercarriage units, Dowty E.8777 Mk.Ds, retract inwards into the stub wings, and the nose leg of Dowty E.7381Y type retracts forward into the extreme nose of the fuselage. Dunlop wheels and tyres are used; their dimensions are 28" x 6.50" and 17.5" x 5.50" (860 x 165 mm and 445 x 140 mm) for the main and nose wheels respectively. Each main unit consists of a two-cylinder telescopic leg with a liquid-spring shock absorber and torque links. The nose undercarriage is a fully castoring self-centring unit and incorporates a shock absorber as well. An arresting cable guard is fitted to the wheel fork assembly. The legs and associated wheel doors are controlled electro-hydraulically. To maintain the necessary deck clearance, the main wheel doors are re-closed after extension of the undercarriage. The faired arrestor hook (Mk.10, 11 or



The fortieth and last production Sea Hawk F Mk.2, WF279.



13 gears are used) is operated hydraulically and retracts rearwards into the recess in the bottom of the rear fuselage.

**The powerplant** is mounted on a tubular strut construction riveted to the front wing spar and anchored to the fuselage keel member. A Rolls-Royce Nene single-stage axial flow gas turbine is used: the RN.4 Mk.101 unit in Mk.1, 2, 3 and 4 aircraft and the RN.6 Mk.103 engine in Mk.5, 6, 50, 100 and 101. A bifurcated jet pipe discharges through the inboard trailing edges of the stub wings. A Plessey TSC.50 Mk.3 cartridge type starter is fitted with six No.2 Mk.3 cartridges in the breach. The fuel is carried in four flexible bag-type fuel tanks in the fuselage; each pair of tanks is interconnected and acts as one unit. The capacity of the forward tanks group is 185 gal (841 l) and that of the rear 212 gal (964 l), 397 gal (1,805 l) in total. 100, 88 or 75-gal capacity external drop tanks can be fitted. Fuel delivery to the burners is controlled by booster pumps, assisted by air pressure.

**The hydraulic system** is of the Dowty "life-line" type. Its engine-driven pump provides pressure of 2,050 lb/sq in (14.139 MPa) to operate the airbrakes, arrester hook, flaps, jettisonable tank release, undercarriage, wing folding, powered ailerons (not on Mk.1) and wheel brakes.

**The electrical system** consists of DC and AC circuits, supplied by two engine-driven generators. The DC operates the whole aircraft electrical system and charges two 12V 25A batteries in series with 24V output (Mk.1), one 24V or two 24V batteries (Mk.2 and later Marks). For the AC supply two type 100A inverters provide power at 115V 400As for operating the artificial horizon and compass. The generators and battery are located in the engine accessory bay.

**The flying controls** are of the conventional "stick and rudder bar" type. The control column has a hand grip with a gun firing trigger, gun camera operating button and wheel brake control lever. The control surfaces are operated through the push-pull tubes. On Mk.2 and later aircraft the aileron control system incorporates an artificial feel unit and hydrobooster units giving power assisted movement. ■



The P.1040, VP401, numbered '87' for participation in the National Air Races at Elmdon on 30 July, 1949.

## Hawker Sea Hawk Mk. 1, 3/5, 4/6 (50) and 100/101 technical data

Length, overall	- Mk.1, 3 / 6, 100&101	39'10.5"/39'8"
		(12,155/12,090 mm)
Length, fuselage/max. fuselage diameter		36'4"/4'10.2" (11,073/1,480 mm)
Wing span/folded span/tailplane span		39'0"/13'3"/13'1.5"
		(11,890/4,040/4,000 mm)
Height	- Mk.1, 3 / 6 / 100&101	8'9"/8'8"/9'9.3" (2,670/2,640/2,980 mm)
Folded height	- Mk.1, 3 / 6 / 100&101	16'9"/16'8"/16'9" (5,100/5,080/5,100 mm)
Wheel track		8'6" (2,590 mm)
Wing and tailplane incidence/wing dihedral		+0°30'/+4°30'
Aileron deflection angle		+12°30' -13°
Flap range, landing/take-off/air brake		-76°30'/-49°30' (-29°15' Mk.1 only)/+21° -29°15'
Elevator/rudder deflection angle		+21° -10°/+22°
Wing/tailplane & elevator area, total		278/40.25 sq ft (25.83/3.74 m <sup>2</sup> )
Tailfin & rudder area, total		
	- Mk.1 - 6 / 100&101	33.0/37.15 sq ft (3.065/3.450 m <sup>2</sup> )
Weight, empty	- Mk.1 / 3 / 6	8,840/9,190/9,560 lb
		(4,010/4,170/4,335 kg)
take-off, no external stores	- Mk.2, 3 / 6	13,400/13,500 lb (6,080/6,125 kg)
take-off, 2x 75-gal drop tanks	- Mk.2, 3 / 6	15,100/15,200 lb (6,850/6,895 kg)
take-off, max. overload	- Mk.2 / 3 / 6	15,100/15,600/16,200 lb
		(6,850/7,075/7,350 kg)
target towing		14,800 lb (6,715 kg)
Max. speed, at sea level	- Mk.2 - 6	598 mph (962 km h <sup>-1</sup> )
at 20,000 ft (6,100 m)	- Mk.6	587 mph (944 km h <sup>-1</sup> )
at 36,000 ft (10,970m)	- Mk.1 - 6	580 mph (901 km h <sup>-1</sup> )
target towing		276 mph (444 km h <sup>-1</sup> )
Rate of climb, initial		5,700 ft/min (28.9 m s <sup>-1</sup> )
Climb to 35,000 ft (10,670 m)	- Mk.1 / 3, 6	12 min/11.5 min
Service ceiling	- Mk.1, 3 / 6	43,200/44,500 ft (13,170/13,560 m)
Range, no external stores		480 miles (770 km)

## Rolls-Royce Nene RN.4 (Mk.101) / RN.6 (Mk.103) turbojet engines

Length/diameter	96.8"/49.5" (2,460/1,260 mm)
Max. thrust, at sea level	5,000/5,200 lb (22.24/23.13 kN)
Power rating, max. take-off	12,500/12,700 rpm
max. continuous	11,800/12,000 rpm
Jet pipe temperature, max. take-off	735/750 °C
max. continuous	635/670 °C
Dry weight	1,618 lb (734 kg)
Fuel (British Spec. No.)	AVTUR, AVTAG or AVCAT
	(D.E.R.D. 2494, 2486 or 2488)
Specific fuel consumption (Mk.101 engine)	1.085 lb/hp/hr (0.860 kg kW <sup>-1</sup> h <sup>-1</sup> )
Oil	OM-11

## Sea Hawk orders and production

Designation	Production, manufacturer	Serial number (s/n) and quantity	Construction number (c/n)	First flight (f/f) / delivery (d)	Qty. built	Qty. conv.	User	Unit / institute	Note
P.1040 N.7/46	prototype prototypes HAL	VP401 VP413, VP422 VP407	(1) (2) (1)	not known f/f 2/9/47 VP413 f/f 3/9/48 VP422 f/f 17/10/49	1 2 1		FAA	A&AEE, RAE	research prototype, no equipment nor armament, became P.1072 VP413 fully navalised, trials a/c, VP422 dive brake scheme trials, VP407 test structure only
P.1072	prototype HAL	VP401	(1)	not known f/f 16/11/49 jet power f/f 20/11/49 rocket p.	1			A&AEE, RAE	converted from P.1040, AS Snarier liquid-fuel rocket
Sea Hawk F Mk.1	1st prod. batch 1st prod. order HAL	WF143 - WF161 WF167 - WF177 WM901 - WM905	(19) (11) (5)	not known WF143 f/f 14/11/51 WF144 f/f 21/2/52 WF145 f/f 18/3/52	35		FAA	A&AEE, RAE, CEPE 700 703, 764, 767 802, 804, 806, 807, 898	WF143 RATOG trials; WF144 arrester landing and catapult trials; WF145 - 161, 167 - 177, WM901 - 905 service trials; WF147 prototype F.2; WF148 - CEPE Canada winterisation trials; WF157 prototype FB.3
	1st prod. batch 2nd prod. order AWA	WF162 - WF166 WF178 - WF192 WF196 - WF235	(5) (15) (40)	AW5837 - AW5841 AW5842 - AW5856 AW5857 - AW5866	60		FAA	736, 738, 764, 767, 787 802, 804, 806, 807, 898 1832, 1836; NAE	WF164 - Naval Fighter School, WF180 - Naval Aircraft Establishment WF196 trials a/c, HAL WF218 became 2nd prototype FB.3
SUBTOTAL					95				prototypes not included
Sea Hawk F Mk.2	prototype, HAL 2nd prod. batch 3rd prod. order	WF147 WF240 - WF279	(1) (40)	not known AW5897 - AW5936 WF240 f/f 24/2/54	1 40		FAA	A&AEE, RAE, NAE 700, 736, 738, 764, 767 802, 807	converted from production F.1, trials a/c WF240 handling & performance trials, AWA, A&AEE, RAE WF243 trials a/c, became prototype FB.5, WF277 - Naval Fighter School
Sea Hawk FB Mk.3	prototype, AWA 3rd prod. batch 4th prod. order AWA	WF157 WF218 WF280 - WF289 WF293 - WF303 WM906 - WM945 WM960 - WM999 WN106 - WN119	(1) (1) (10) (11) (40) (40) (15)	not known AW5879 AW5937 - AW5946 AW5947 - AW5957 AW5958 - AW5997 AW5998 - AW6037 AW6038 - AW6052	1 1 116		FAA	A&AEE, NAE, TRU 700, 703, 736, 738, 764, 767, 787 800, 802, 803, 806, 807, 811, 895, 897, 898	converted from production F.1, trials a/c converted from production F.1 WF294 trials a/c, WF294, 303 & WM912 - TRU, Ford WF280 trials a/c, became prototype FGA.4 WF299, WM982 - Naval Fighter School, WM907 radio trials a/c, NAE WM914 trials with F.4 camera installation WM992 controls trials, NAE
Sea Hawk FGA Mk.4	prototype, AWA 4th prod. batch 5th prod. order AWA	WF280 WV792 - WV807 WV824 - WV871 WV902 - WV922 XE327 - XE338	(1) (16) (48) (21) (12)	AW5937 AW6053 - AW6068 AW6069 - AW6116 AW6117 - AW6137 AW6288 - AW6299	1 97		FAA	A&AEE, NAFDU 700, 736, 738, 764, 787 800, 801, 802, 804, 806, 807, 810, 811, 895, 898	converted from production FB.3, modified outer wings for 4 bomb pylons WV825 trials a/c for vortex generators and powered ailerons WV840 flight refuelling trials, 1956 XE327 - NAFDU, armament trials, A&AEE
Sea Hawk FB Mk.5	no production conversion only AWA			d 1955	50 *		FAA	700, 736 802, 806	examples of converted a/c: WF299; WN108, 115, 116, 119 WM907, 913, 928, 936, 937, 939, 943, 961, 965, 969, 983, 993, 994 (became G-SEAH), 998
Sea Hawk FGA Mk.6	5th prod. batch 6th prod. order AWA	XE339 - XE344 XE382 - XE411 XE435 - XE463 XE489 - XE490	(6) (50) (28) (2)	AW6300 - AW6305 AW6306 - AW6355 AW6356 - AW6384 AW6385 - AW6386	87		FAA	700, 736, 738, 764, 781 800, 801, 803, 804, 806, 810, 895, 897, 898, 899	XE369 trials a/c for FGA.5 installations XE456 trials a/c, also for Mk.100/101 installations, 6/56 - 7/57 XE489 became G-JETH, XE490 crashed on delivery 10/1/56 XE491 - XE498 (AW6387 - AW6394) - 8 a/c cancelled
	no production conversion only AWA			d 11 - 12/55	31 *				examples of converted a/c: WV792, 794, 795, 797, 798, 825, 826, 828, 831, 836, 841, 856, 860, 861, 865, 870, 903, 908, 909, 911, 914 XE327, 328, 330, 331, 333 - 338
Sea Hawk FGA Mk.6 (Indian)	no production refurbished, AWA production, AWA no production refurbished, AWA	IN151 - IN159 IN160 - IN173 IN174 - IN195	(9) (14) (22)	eg. AW6023 (IN152) not known eg. AW6294, 96; 6306, 11, 16, 22, 79	9 14 22		INA	300, 551	mixed batch of FB.3 and FGA.6 a/c IN152 ex-FAA FB.3 WM985 produced in 1960 - 1961 IN181, 182, 183, 184, 185, 186 ex-FAA XE378, 458, 383, 394, 362, 397, IN187 ex-FAA XE333; IN191, 192, 193 ex-FAA XE335, 372, 367 * total number of a/c converted to FB.5 and FGA.6 unavailable
SUBTOTAL					101	62 *			
Sea Hawk FGA Mk.50 (Dutch)	production AWA	XL237 - XL241 XL269 - XL275 XL305 - XL314	(5) (7) (10)	AW6621 - AW6625 AW6626 - AW6632 AW6633 - AW6642	22		RNIN	3, 860	Dutch Navy registrations 6-50 to 6-71, from 21/8/59 changed to 111-131 6-53 crashed 6/11/57 (no new reg. allotted), 6-61/121 or 30/9/59, 6-65/125 or 9/3/62, 6-66/126 or 8/7/60
Sea Hawk FGA Mk.100 (German)	production AWA	VA220 - VA236 VB120 - VB136	(17) (17)	AW6653 - AW6669 AW6670 - AW6686	34		FGN	MFG 1 MFG 2	interceptor fighters with GGS; VB120 or 17/12/63, VB122 or 14/6/63 VA223, 225, 229, 230, 233, 235 - IN231, 239, 232, 233, 234, 235, VB130, 131, 134 - IN236, 237, 238 IN230 ex-FGN VA221 or VA222
Sea Hawk FGA Mk.100 (Indian)	no production	IN230 - IN239	(10)	eg. AW6656, 58, 62, 63, 66, 68, 80, 81, 84	10		INA	300, 551	
Sea Hawk FGA/RR Mk.101 (German)	production AWA	RB240 - RB256 RB360 - RB376	(17) (17)	AW6687 - AW6703 AW6704 - AW6720	34		FGN	MFG 1 MFG 2	all-weather fighters with Ekco ASR; RB375 AAM & AGM trials RB242, 247, 251, 252, 255, 256 - IN247, 248, 250, 256, 243, 244 RB369, 371, 372, 375 - IN245, 252, 246, 240
Sea Hawk FGA/RR Mk.101 (Indian)	no production	IN240 - IN257	(18)	eg. AW6689, 94, 98, 99; AW6702, 03, 13, 15, 16, 19	18		INA	300, 551	
TOTAL					543	145 *			4 prototypes included; * total number of Mk.3 and Mk.4 conv. unavailable



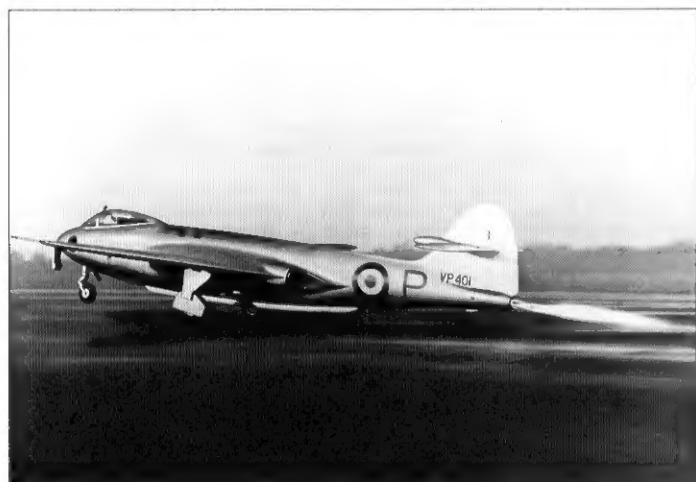
The Hawker P.1040 prototype came into existence as the company's private venture during 1944-45. In fact it was the Admiralty who saved the project, later being known as the Sea Hawk. In the photo the very first Hawker jet aeroplane, VP401, is seen at Langley in September 1947. Its original rectangular exhaust exit fairing is clearly visible.



A first and third prototype comparison: different cockpit canopy hood, wing span increase and the addition of an arrestor hook. Note also the new roundels on the latter aircraft.



FAA Museum, S/HWK 9

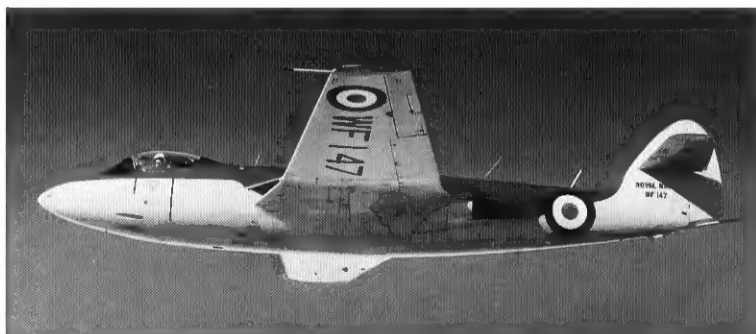


The first fully navalised N.7/46 prototype, VP413, displays its wings folded upwards. The cockpit canopy shape is not yet the definitive one, likewise the main undercarriage fairings and nosewheel leg (left). 'VP401' was re-engined with a Nene II powerplant and an AS Snarler liquid-fuel rocket was added. It was in this guise that it appeared as the sole P.1072 prototype in November 1950. Because official interest in reheat declined, only six rocket-powered flights were performed (right).





This page depicts Sea Hawks manufactured by Hawkers. 'WF143' (above), pictured in November 1951, was the first production F Mk.1, which differed from the prototypes in having a modified hood shape and definitive wing airbrakes. It was retained by the manufacturer for development work. 'WF144' flew for the first time on 21 February, 1952, and was assigned to carrier trials aboard HMS Eagle (below left). The early production F1s did not have the fin bullet fairing.

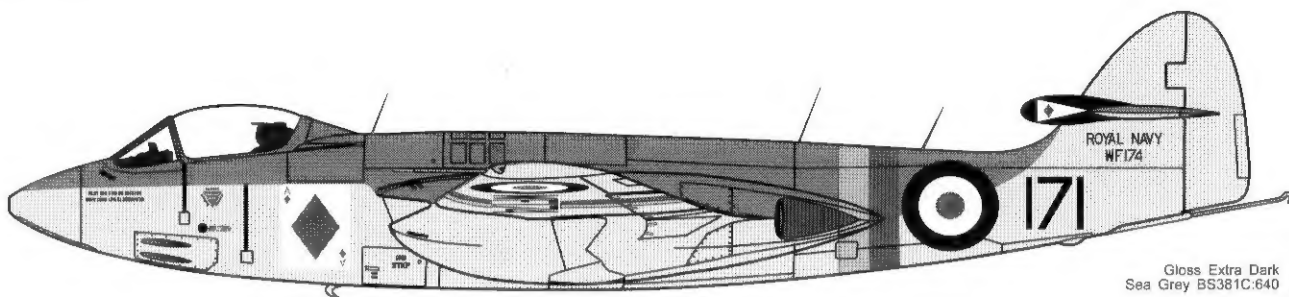


The power-assisted aileron system, which improved the lateral control of the aircraft, was first tested on the 'WF147', thus becoming the prototype Sea Hawk F Mk.2 (above).



Clean lines of the fighter configuration of the Sea Hawk, WF159. The serial number positioning on the wing lower surfaces is shown to good effect in the right-hand photo. A dozen brand new Sea Hawks of No.898 NAS lined up at RNAS Brawdy, Pembrokeshire, on 17 March, 1954, with 'WF156/107' nearest the camera. This aircraft was flown by Lt. J.L. Newns (below).





No.806 Squadron 'Ace of Diamonds' insignia is white with red letters and diamonds



#### Sea Hawk F Mk.1, WF174/171

**No. 806 NAS, RNAS Ford, Sussex, October 1953**  
Standard fighter colouring consists of Extra Dark Sea Grey upper surfaces and Sky lower surfaces according to Pattern No.2. Note that the grey does not overlap the wing leading edge to undersurfaces. Fuselage and wing bands (both surfaces) are red and yellow (temporarily applied during 'Exercise Mariner'), fin bullet is black with squadron badge on white triangle. Type D roundels in six positions, all lettering black.

Gloss Extra Dark Sea Grey BS381C.640

Gloss Sky BS381C.210

Bright Red BS381C.138

Yellow BS381C.356

Bright Blue BS381C.108

Burnt Metal

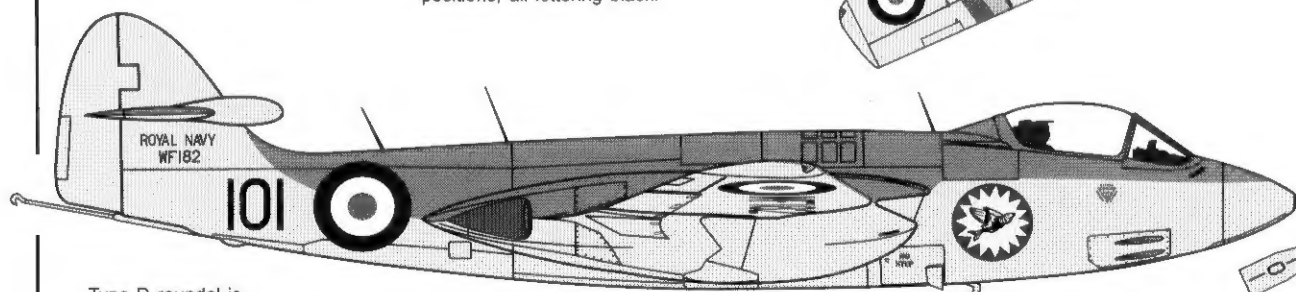
White

Black

Blue

Red

Orange

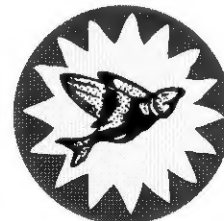


Type D roundel is Bright Red, White and Roundel Blue

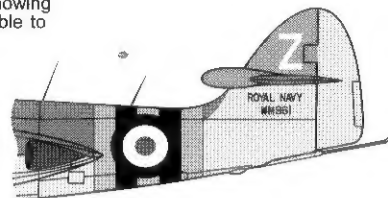


#### Sea Hawk F Mk.1, WF182/101

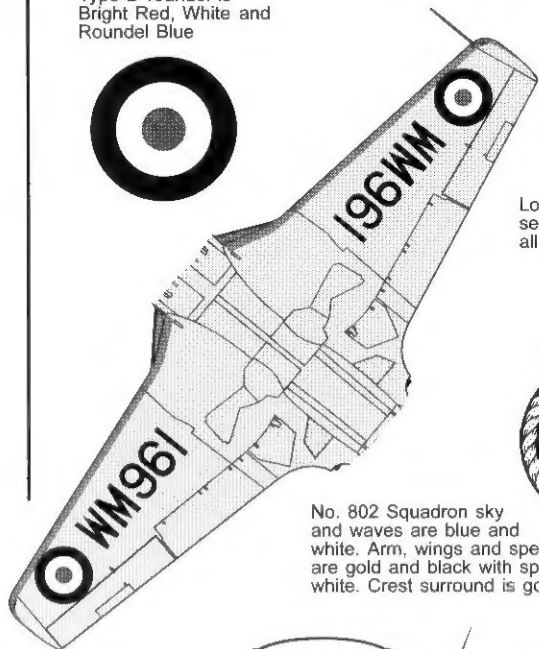
**No. 898 NAS, RNAS Brawdy, Pembrokeshire, March 1954**  
Extra Dark Sea Grey and Sky finish with black lettering as above. 'Flying fish' emblem below the cockpit on both sides.



Lower surface plan view showing serial positioning is applicable to all FAA and INA aircraft



No. 898 Squadron flying fish is black with grey and white detail superimposed on a yellow sun against a blue disc

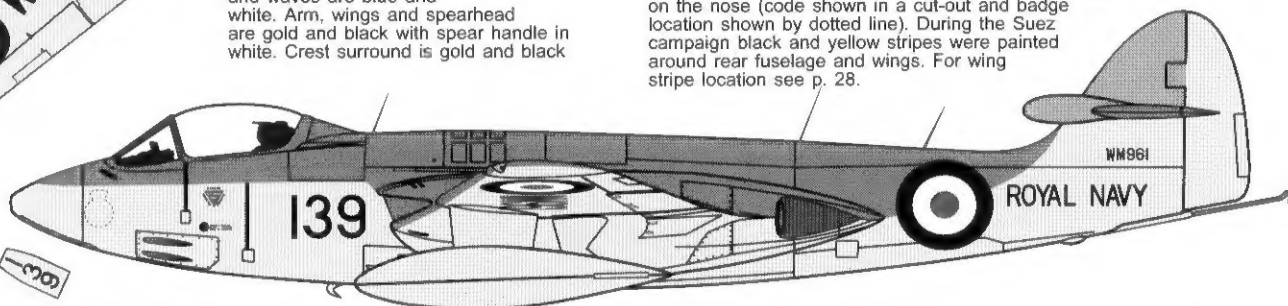


No. 802 Squadron sky and waves are blue and white. Arm, wings and spearhead are gold and black with spear handle in white. Crest surround is gold and black

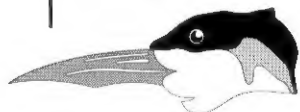


#### Sea Hawk FB Mk.3, WM961/139

**No. 802 NAS, HMS Albion, 1956**  
Extra Dark Sea Grey and Sky colours with black lettering. The grey overlaps the wing leading edge. Fin and fin bullet are red. Later a white code letter 'Z' was added to fin sides, as was the squadron badge on the nose (code shown in a cut-out and badge location shown by dotted line). During the Suez campaign black and yellow stripes were painted around rear fuselage and wings. For wing stripe location see p. 28.

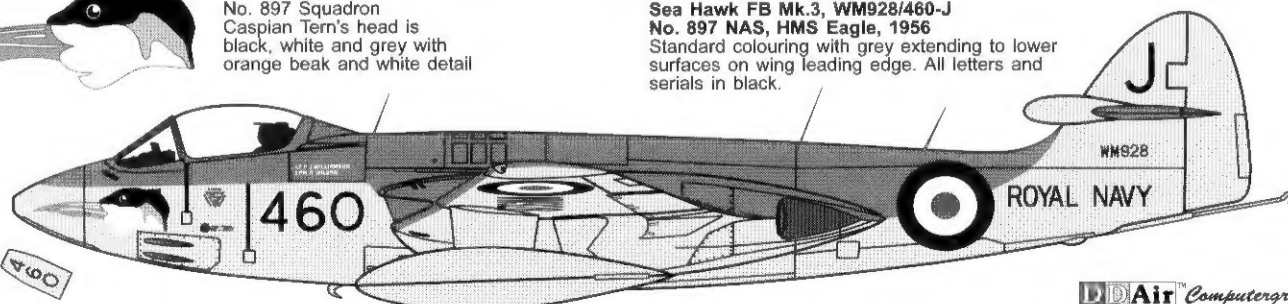


No. 897 Squadron Caspian Tern's head is black, white and grey with orange beak and white detail

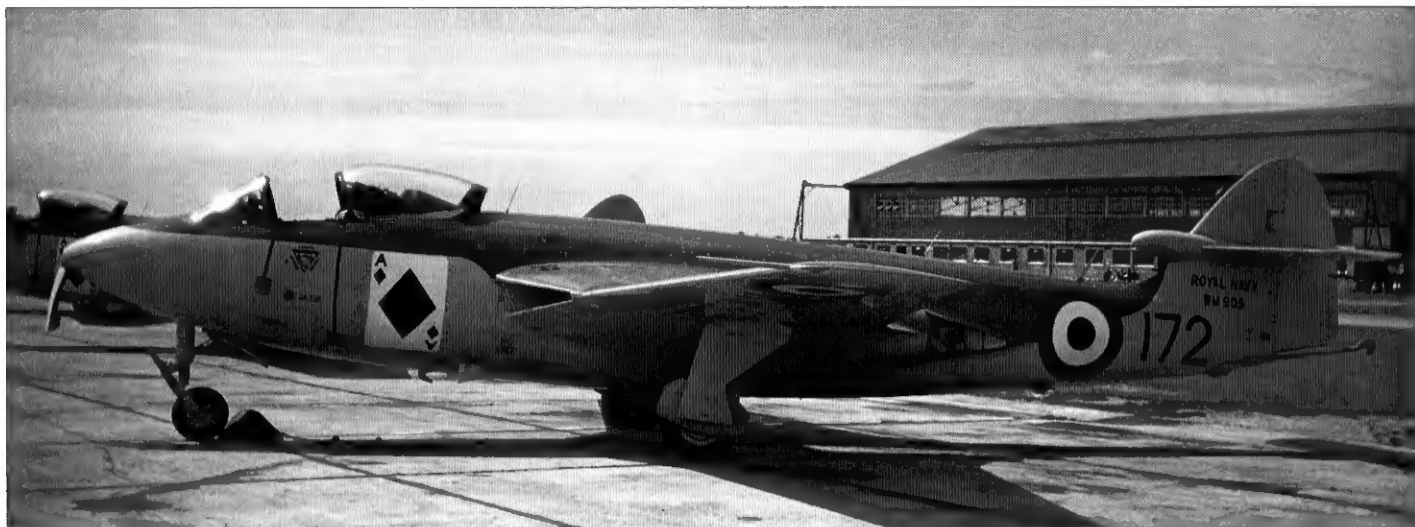


#### Sea Hawk FB Mk.3, WM928/460-J

**No. 897 NAS, HMS Eagle, 1956**  
Standard colouring with grey extending to lower surfaces on wing leading edge. All letters and serials in black.







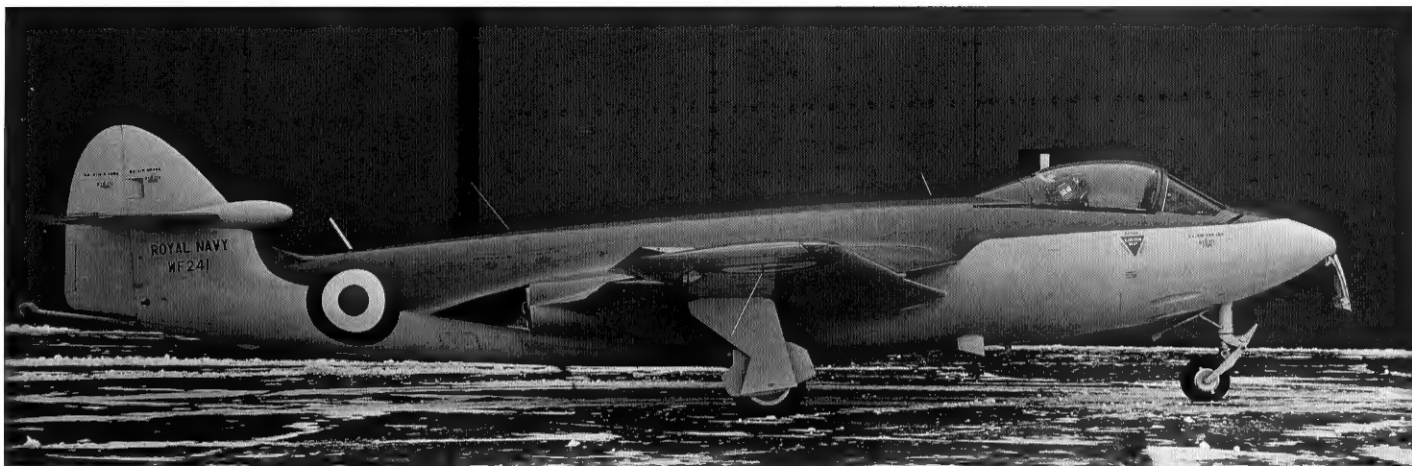
The last Hawker-built Sea Hawk, WM905/172, displays the distinctive 'Ace of Diamonds' emblem of No.806 Squadron, the first FAA unit to become operational with the type. Note the early small style of the 'ROYAL NAVY' inscription and side number position on the rear fuselage and the BA antenna under the fuselage roundel (above).  
An in-flight study of the F Mk.1, WF159 (below right), and a pre-flight rush aboard HMS Eagle (below left). Note the unfinned 100-gal drop tanks.



Nestling closely side by side at Bitteswell plant late series F.1s await delivery to their operator (right).

A sole Sea Hawk, WF148, was delivered to Canada for cold weather testing. This photo was taken at RCAF Unit Fort Churchill, Manitoba, in 1952.





The second production Sea Hawk F Mk.2, WF241, just off the Armstrong Whitworth production line. With glossy paint applied, all stencils and inscriptions are present. Note also the aerials on the fuselage spine and below the wing (above). For antenna details see drawing on p. 30. A completely black FB Mk.3, WM969/039 (later upgraded to FB.5), of the FRU, which was operated by Airwork Services Ltd. from Hurn, Hants. There is a Harley Light in the port underwing tank used for ease of acquisition during simulated frontal attacks (below left).

The A.J. Jackson Collection



The Sea Hawk FB Mk.3, WM915 (most probably in the guise of re-engined FB.5 aircraft), wearing the final colour scheme introduced in 1959/60. The air scoop above the air intake (covered by blanking plate) characterised many FB.3/5 and FGA.4/6 aircraft with modified accessories gearbox (above).

FAA Museum, S/HWK 98



No.898 Squadron Mark 3 aircraft being prepared for flight at RNAS Brawdy on 17 March, 1954. The engine accessory bay and port rear gun bay are open for inspection and re-arming. Note the oval section 88-gal drop tanks under the inner wing pylons (above).

No.897 NAS – a first-line unit aboard HMS Eagle – had this Sea Hawk FB Mk.3, WM928/460-j, on the strength in 1956. It is fitted here with finned plastic drop tanks. A colour profile of this aircraft appears on p. 6.

IWM, A32898



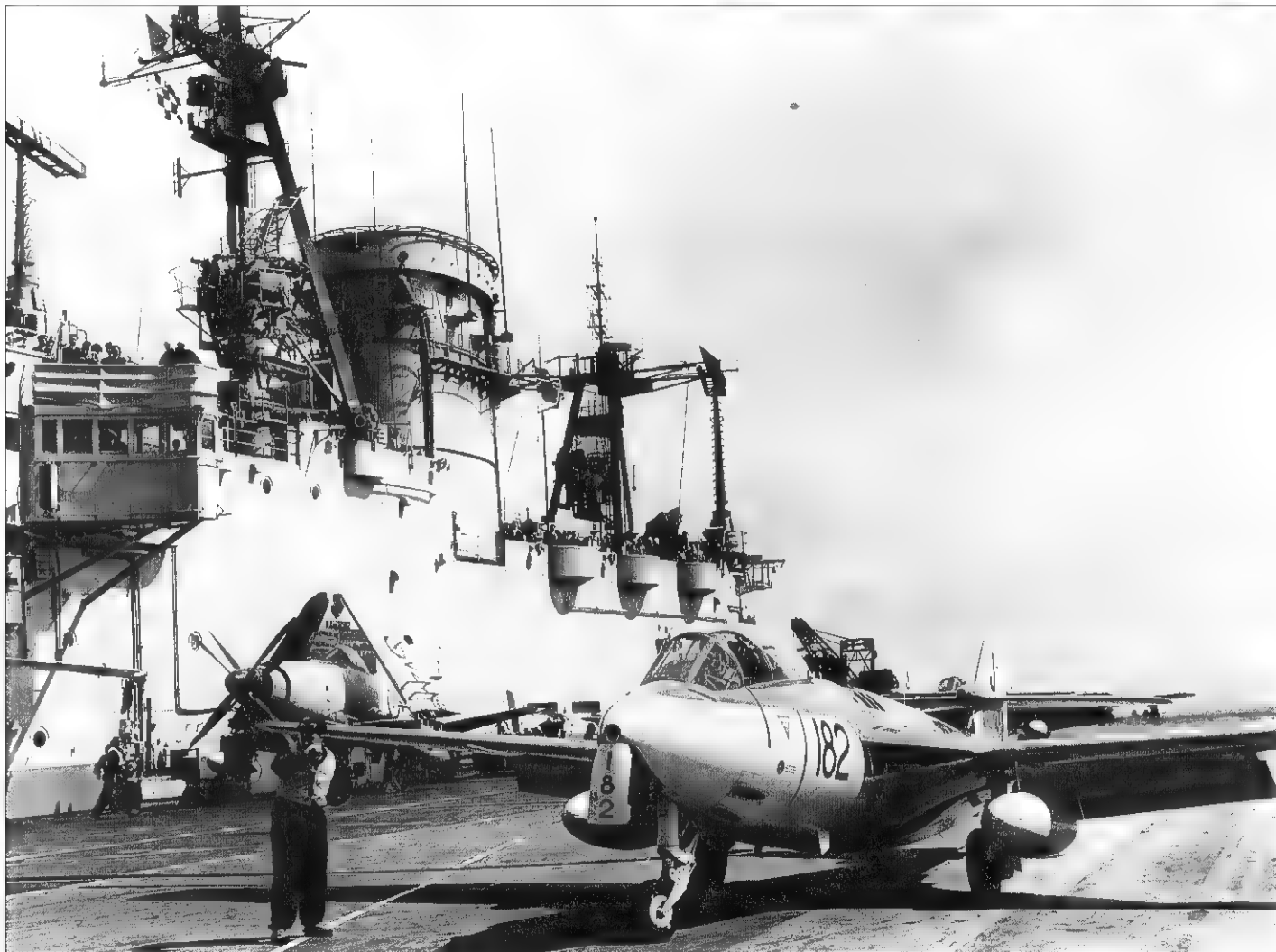


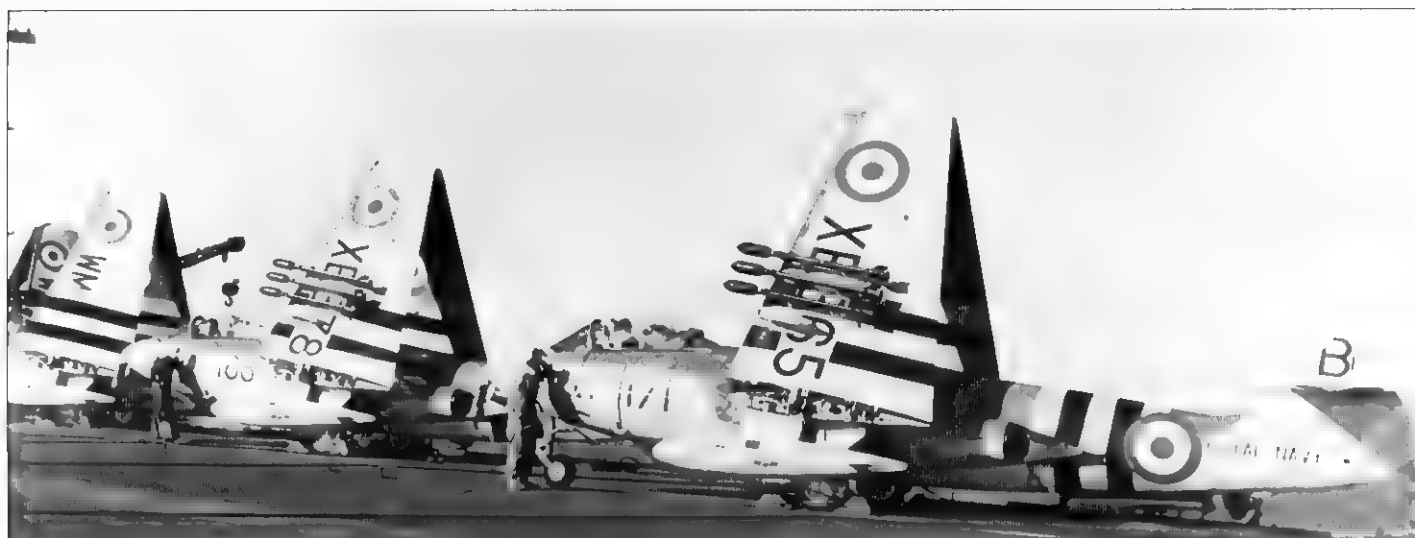
No.807 NAS Sea Hawk FGA Mk.4, WV907/126, catches the arresting cable a split second before final touch-down on HMS Albion (left). 'WV860/635-LM' was operated by No.738 Sq. based at RNAS Lossiemouth and was photographed during a visit to the CFS at RAF Little Rissington in 1961 (right). Coloured smoke produced by Sea Hawk FGA Mk.4s of No.804 NAS aboard HMS Eagle in 1956.



An FGA Mk.4, WV909/983, of the Lossiemouth Station Flight painted in black all over; note the UHF blade antennae (above).

"Waiting for take-off" flight deck scene with No.804 Squadron Sea Hawk '182-J' aboard HMS Eagle (below).





No.804 Sq. Mark 6s operated temporarily from HMS Bulwark during the Suez campaign, 'XE365/171 B' and 'XE378/168 B' shown here (above). The latter aircraft with its original Ark Royal fin code 'O' (left) and the same squadron's machine, 'XE447/172-A', on HMS Albion deck lift (below). Note the later camouflage scheme; for details see colour profile on p.28.



FGA Mk 6, XE444/104-O of No.800 NAS aboard HMS Ark Royal (left) and the same ship's flight deck with No.898 Sq. Sea Hawks and No.815 NAS Gannet AS Mk.1s on 27 May, 1957 (below).







Sea Hawk FGA Mk.6, XE436/643-LM, of No. 738 NAS, was on static display during the Royal Observer Corps Day at the CFS Little Rissington on 28 August, 1960 (above).

"Spider's Web" saving No. 806 Squadron Sea Hawk, XE435/179-E, after the arrestor hook failed to lower. This emergency landing occurred in March 1959 (left).



Sea Hawks of No. 801 Sq., coded '118' and '128' (XE445), aboard HMS Centaur. Each aircraft is loaded with no less than 28 RPs under the wing rails (above).

Looking resplendent following a complete restoration the Sea Hawk FGA Mk.6, XE340/A, wears the colours of No. 898 NAS. It was a static exhibit at the Air Day held at RNAS Brawdy in August 1966 (far right).

Windy weather adds to the landing deck scene aboard HMS Eagle in May 1956. The Sea Hawks belong to No. 899 Squadron FAA - nearest the camera is the 'XE387/494-J' assigned to pilot Lt. D.L. Graham.





Siegtfried Wache, AGL



A publicity photo of the German Sea Hawk Mk.100, skilfully retouched and given spurious code and marking (above). 'RB+246', an FGA.101, of No.1 Naval Reconnaissance Sq. of MFG-1 (left) and 'RB+368' with an Ekco air search radar, MFG 1 Jagel, August 1961 (below).



Siegtfried Wache, AGL

N.F.L. Terlouw/Airview via Erwin J.W. Stam



N.F.L. Terlouw/Airview via Erwin J.W. Stam

The Netherlands took delivery of 22 Sea Hawks, designated FGA Mk.50. '119' and '125' (registration F-59 and F-65 respectively) were flown from NAS Valkenburg; the latter aircraft crashed into the North Sea in March 1962. Note the late style marking introduced in August 1959 (above). Both photos are dated 1961/62. An Indian Sea Hawk, IN152/072-W, was originally the Fleet Air Arm FB Mk.3, WM985, upgraded to FGA.6 standard. After delivery to INAS 300 it served aboard the sole Indian Navy carrier INS Vikrant. Note the practice RPs and small calibre bomb rack on the inner wing pylon and IFF rod antenna on the top of the fuselage (below).



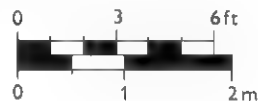


# Hawker Sea Hawk



# Hawker Sea Hawk

1/72



FGA.4/6



FB.5

F1.2, early FB.3  
and FGA.4 a/c

F.1

FGA.100/101

F1/2

late F1 a/c

early F1 a/c

N

O

F.1

FGA.4/6

FGA.50/100/101

FB.3/5

FGA/RR.101

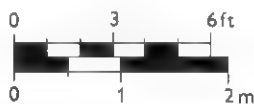
FGA.100/101



# Hawker Sea Hawk

Indian FGA.6

1/72



FGA.6

AIM-9B pylon

bomb/drop tank pylon

FGA.100/101

FGA.6

some F.1, 2,  
FB.3 and  
FGA.4 a/c

PR camera  
windows

F.1/2

F.1

FGA.6



some FGA.50 a/c

FGA.50

© MARK I.

# Hawker Sea Hawk

1/12

0 3 6ft  
0 1 2m

FGA.100

FGA/RR.101

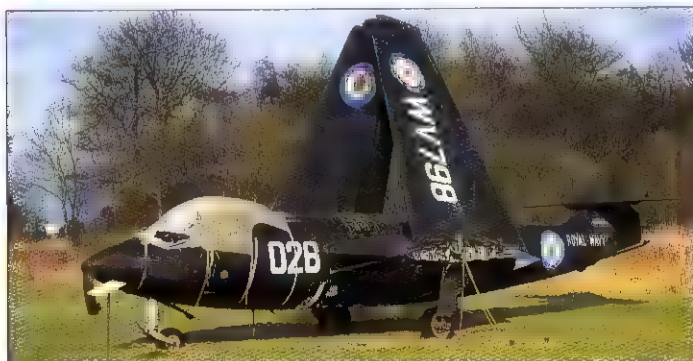


Overall views of the Sea Hawk nose and front fuselage. At the tip of the nose is a cockpit air conditioning system ram intake and just ahead of the windscreen side panels are two heating air spill louvres and in the centre the access door to the air system intercooler. In the fuselage port side, below the cockpit canopy, are two extended boarding steps with an external hood jettison-break window in between. Note the cannon muzzles and No.804 Sq. Tiger's head motif (compare with a different design on p. 19).





Sea Hawk FB Mk.3s of No.898 NAS, WM928/111-Z nearest the camera, aboard HMS Albion leaving Toulon in January 1955 (left). IWM Duxford's preserved Sea Hawk FB Mk.3, WM969/10-Z, with the 'Flying fish' emblem of the same unit (above), was one of about 50 machines converted to Mk.5 standard. It served as '036' with the FRU at Hurn until May 1964.



FB.5 (FB.3), WM913/456-J (ex-'616-LM') wearing No.987 Sq. emblem, currently loaned by Sea Cadets of Fleetwood to the Newark Air Museum (left) and ex-Airwork Services FRU FGA.6 (FGA.4), WV798/026, seen at Lasham Aerodrome in March 1992.

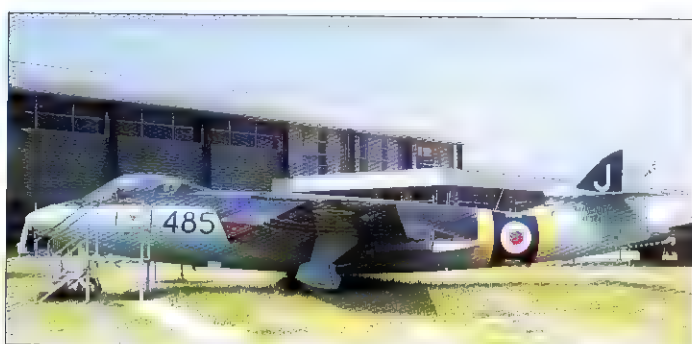


Sea Hawk FGA Mk.4, WV911/115-C, was withdrawn from service in September 1959. Since 1974 it had been with AES at Lee-on-Solent (photo from July 1980) and now it is in the hands of BAe Systems and located at Dunsfold (left). Only a handful of the FGA Mk.4 aircraft were upgraded to FGA.6 standard, WV797 being an example (right). It was relegated to No.1 School of Technical Training in January 1971 after a varied service with Nos.787, 899, 898 and 738 Squadrons. It has been acquired by the Midland Air Museum, Coventry.

A spectacular scene aboard the 'Carrier' display at FAA Museum. WV856/163 is a rebuilt Sea Hawk FGA Mk.6 in colours of No.806 NAS with playing card motif on the nose (below).







Sea Hawk FGA Mk.6, XE368/200-J, preserved at Cornwall Aero Park, Helston. Its last operational user was No.738 Squadron at Lossiemouth, where it was coded '651-LM'. It became an instructional airframe on 20 September, 1962 and received a new identification A2534. At present the aircraft wears the colours of No.897 NAS (left). Sea Hawk XE364/485-J (in fact XE489) at the Aircraft Museum, Southend Airport, in the early 1970s. It has been repainted in the scheme representative of the Suez campaign aircraft with the wing stripes covering up the underwing serials; note the "striped" arrestor hook (right).



'RB+248' and 'RB+365' were the ninth and the twenty-third Sea Hawk FGA/RR Mk.101, respectively, which were delivered to the Federal German Navy during 1958-59 (above and below left). Just visible behind the drop tank in the upper photo is a special pod for the Ekco search radar. Only two units operated the type – the 1st and the 2nd Naval Air Wing (MFG 1 and MFG 2).



Dutch Sea Hawk FGA Mk.50, 131-D, located in the Soesterberg Museum, is an ex-FAA machine, reportedly the FB.3/5, WM983 (right). Two Indian Navy Sea Hawks, IN184 nearest the camera, taxiing at RAF Sharjah before departing for Karachi in 1963 (below).





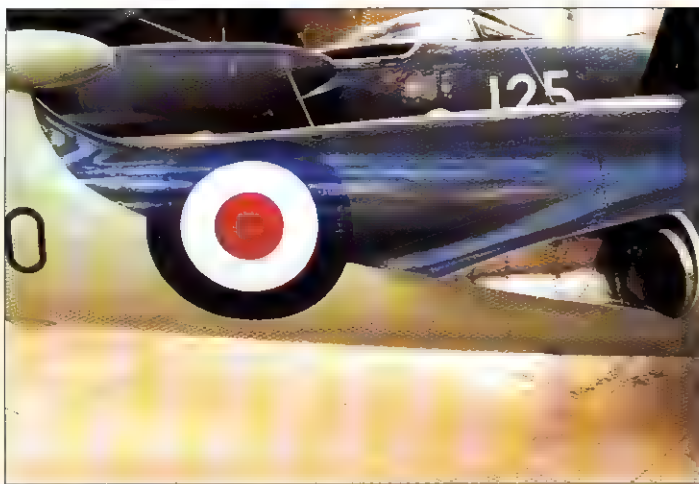
Sea Hawk FGA.6 WV888/163, rests inside the Fleet Air Arm Museum hangar in December 1982. Its markings commemorate the first Sea Hawk equipped P4A unit - No 806 'Ace of Diamonds' Squadron, which took on their first aircraft as early as March 1953.  
Photo Bob Turner











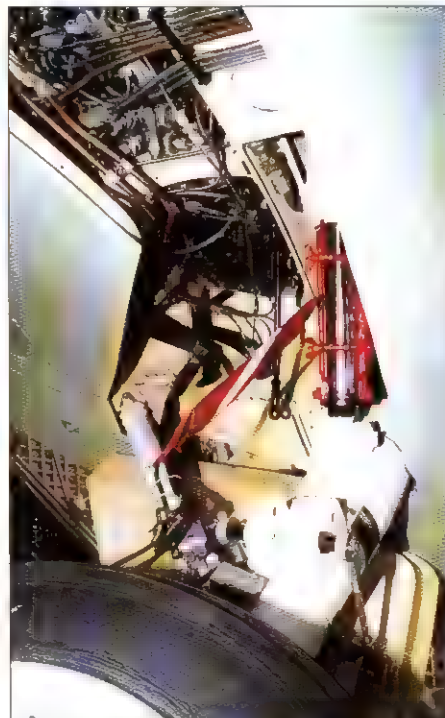
Front fuselage of the Sea Hawk F Mk.2. Light reflection underlines the curved outline of the cockpit hood. Note the colourful 'Tiger's head' emblem (right). The rear fuselage section was detachable at frame No.29 which divided the exhaust duct fairing. Below the fairing is a radio and reconnaissance camera access panel. The fuselage insignia demonstrates the proportions of 1:2:3 for radii ordered for Type D roundel (left).

Erwin J.W. Stam



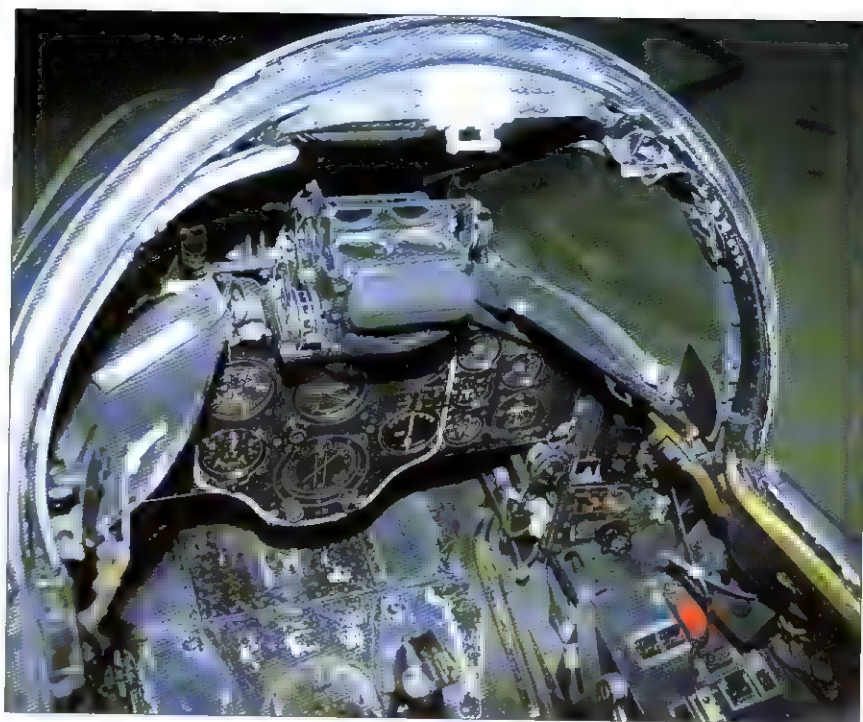
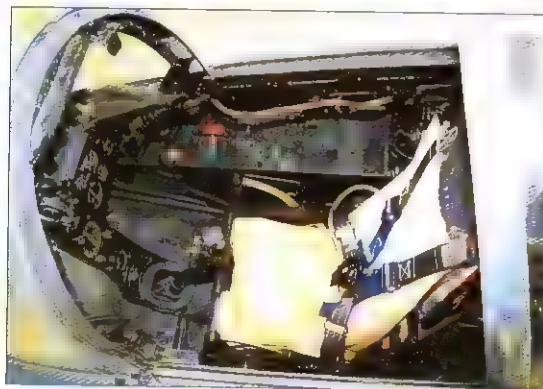
Tail section of the restored Dutch Navy Sea Hawk shows the national insignia and the later type of the MLD markings (above).

Starboard wing lower surface with roundel and serial location representative of the Royal Navy Sea Hawks. Note the narrow grey stripe on the leading edge (right).

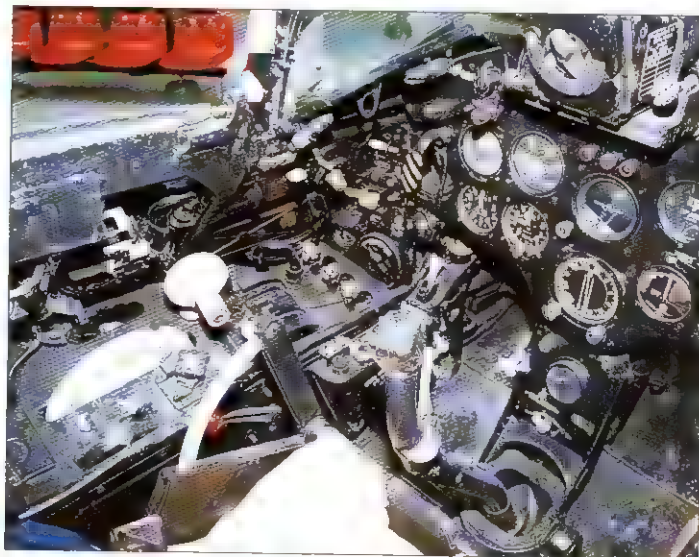


Nosewheel undercarriage bay with recessed floor and ram air inlet duct on the port side (left). Port wheel bay outer section, looking aft, reveals the hydraulic system piping and valves and radius leg pivot hinge; of note are the aileron control rod and arm and RATOG junction box (centre). Port main undercarriage wheel and telescopic leg with torque links interconnecting the upper and lower leg cylinders (right). Note that the undercarriage safety stops (red beam and sleeves) are in place.

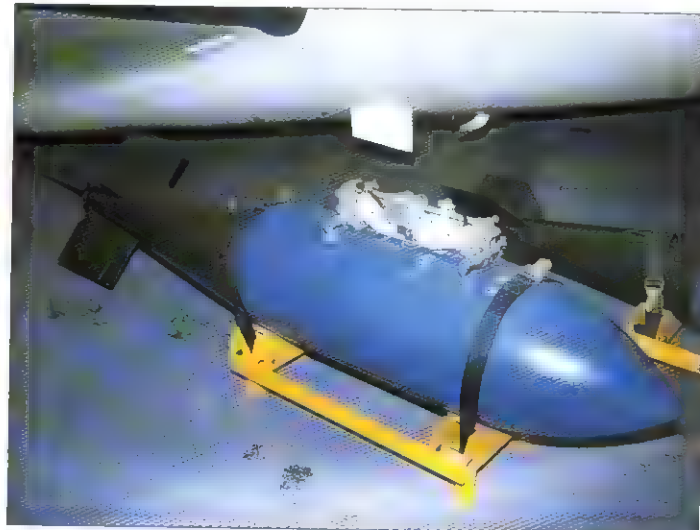
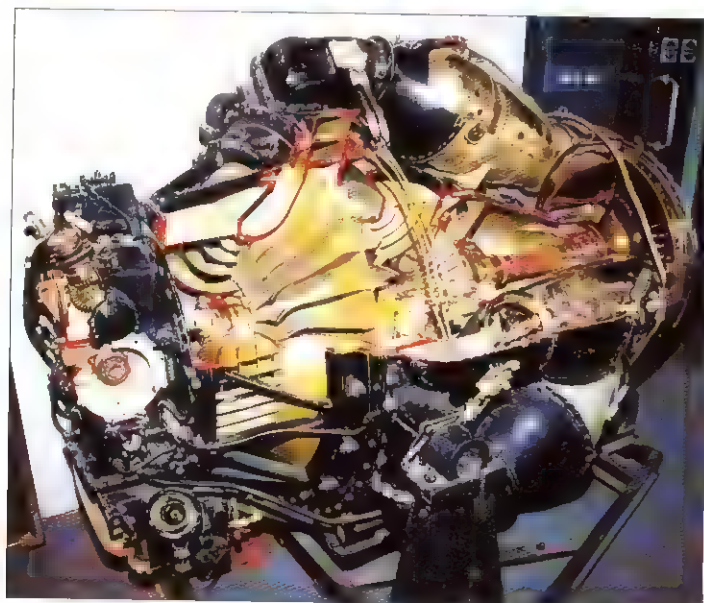




The Sea Hawk F Mk.2 cockpit with the main instrument panel, its shroud and a Mk.4E gyro gunsight in the centre (above). Starboard side of the GGS installation with the instrument panel shroud removed (top left) and an overall view of the FB Mk.5 cockpit; note the Martin-Baker seat type 2F safety harness (left).



Rear part of the cockpit with the canopy hood opened. Above the ejection seat headrest is a face blind firing handle (left). Mark 5 instrument panel and port side console (above). For instrument and control reference see p. 23.

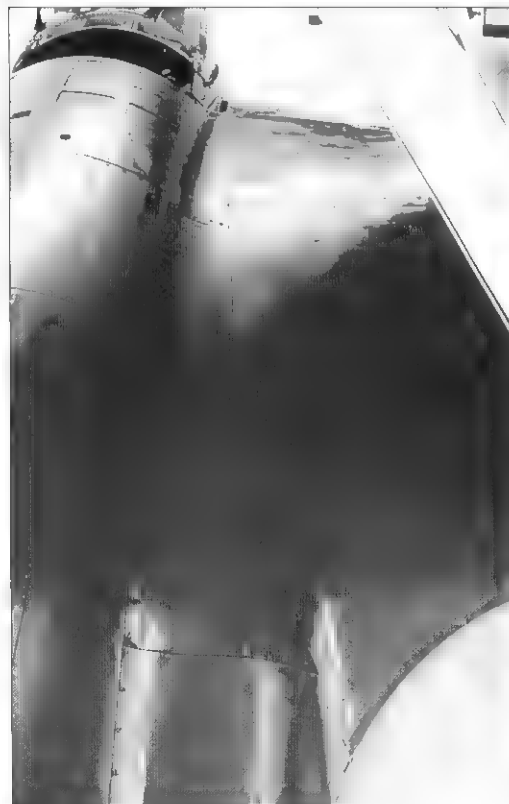
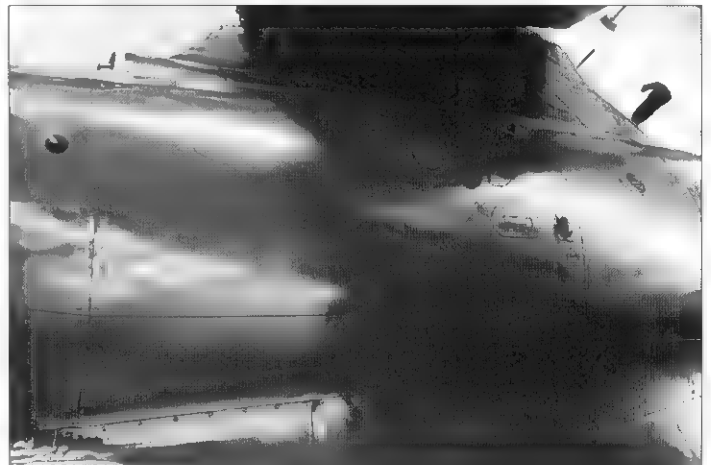


An instructional sectioned Rolls-Royce Nene engine (left) reveals the inner details of this centrifugal-flow turbojet, which was, at its best, able to give a thrust of 5,300 lb st (23.58 kN). The bomber and ground-attack versions of the Sea Hawk could carry a maximum of two 1,000lb (454kg) bombs; here an MC practice bomb Mk.15 is displayed (above).



Port side of the windscreen showing the instrument panel shroud and gyro gunsight; note the solenoid distribution pipe for glass demisting (above), and the open cockpit canopy cover (above right). Sliding canopy rail, front fuel tank filler cap and engine accessory bay panels behind the cockpit (right).

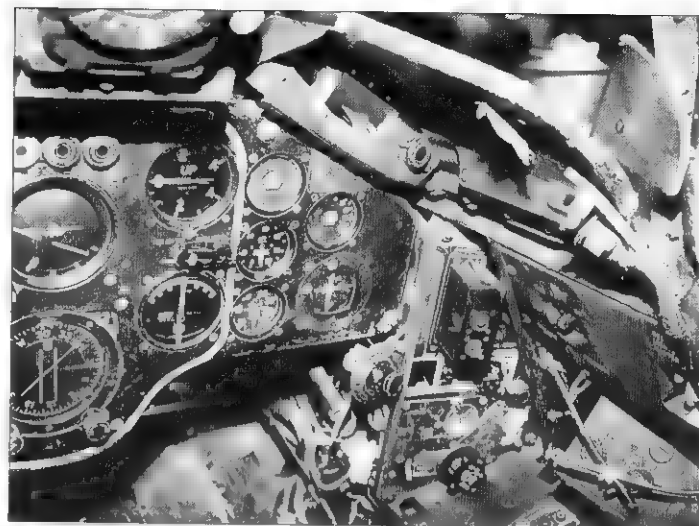
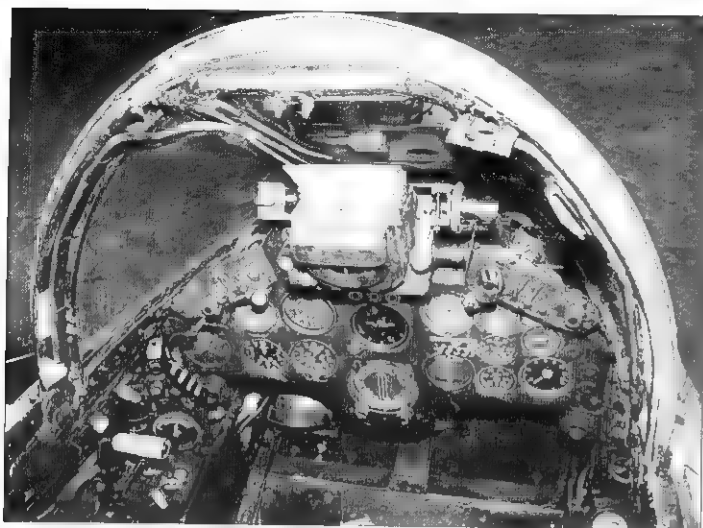
Centre fuselage including plenum chamber, engine bay saddle tank and aft main fuel tank (below and below right).



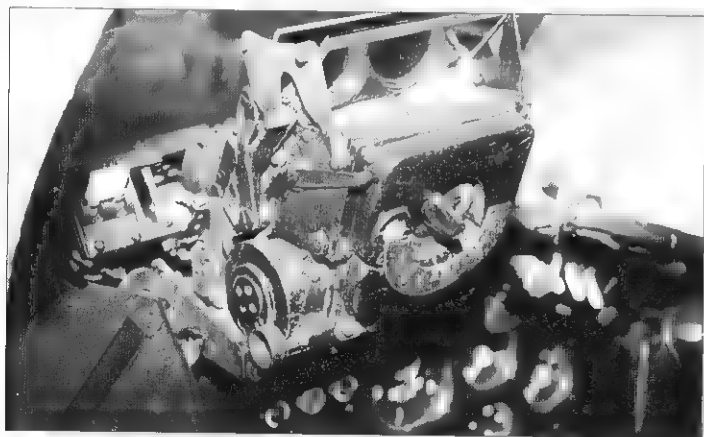
Fuselage centre section and starboard stub wing, looking forward. The small circular hole in the engine cover is a suction relief valve intake of the fuel system installation (left). Early Sea Hawk, under construction, shows to good effect an arrestor hook and fairing, wing flap inner construction and tailplane radio altimeter aerials.



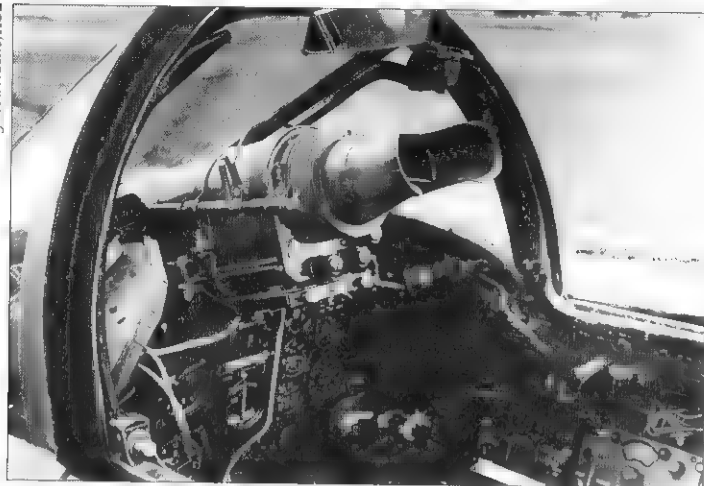




Forward view of the windscreen frame, the gyro gunsight and the main instrument panel with six normal flight instruments in the centre, FGA Mk.4/6 depicted (left), and engine controls located on the right-hand side of the instrument panel, here of an incomplete F2 aeroplane. The box on the right is an inverter reset relay with switches (right).



The Mk.4E gyro gunsight was fixed on a mounting which retracted downwards in case the aircraft had to be abandoned in an emergency (above). Cockpit port side with prominent elevator trim control wheel, triple pressure gauge and throttle lever (right).



Siegfried Wache, AGL

## MARTIN-BAKER Mk.2D EJECTION SEAT



Siegfried Wache, AGL

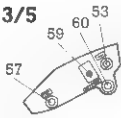
Mk.101 aircraft were fitted with air search radar equipment in place of the GGS and control displacement changes were also made in the starboard console (above left and left). The Martin-Baker Mk.2D ejection seat incorporated a K-Type dinghy and a Type J pack in the seat well (above).



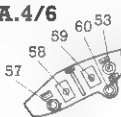
Siegfried Wache, AGL



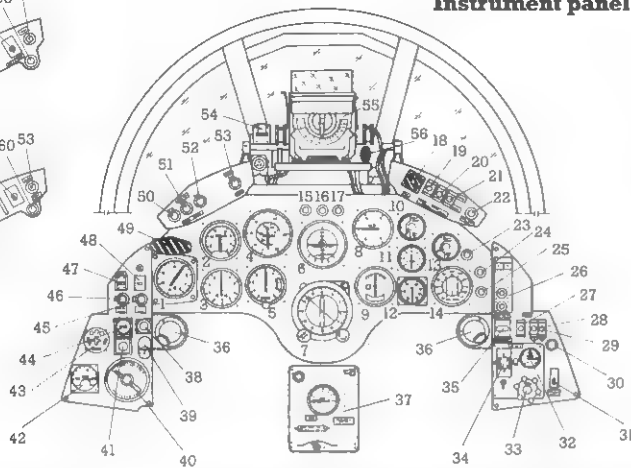
FB.3/5



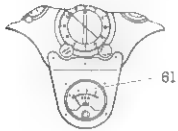
FGA.4/6



## Instrument panel

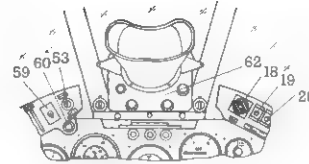


F.1



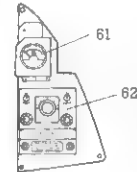
**Instrument panel:** 1) Radio altimeter 2) Machmeter 3) RPM indicator 4) Airspeed indicator 5) Altimeter 6) Artificial horizon 7) Gyro compass 8) Climb/descent indicator 9) Turn and slip indicator 10) Front fuel contents gauge 11) Oil pressure gauge 12) Cockpit pressure altimeter 13) Rear fuel contents gauge 14) Altimeter limit switch (F.1), ARL 18049 indicator (other versions) 15) Top generator failure warning light (not on F.1) 16) Bottom generator failure warning light (not on F.1) 17) Fuel pressure warning light (not on F.1) 18) U/c warning light 19) Port demister switch 20) Starboard demister switch 21) Camera gun aperture switch 22) Hydraulic pressure warning light (F.1) 23) Fuel pressure warning light (F.1) 24) Top generator failure warning light (F.1) 25) Bottom generator failure warning light (F.1) 26) Inverter reset relay switches 27) Engine igniter switch 28) Engine master circuit breaker 29) Engine igniter circuit breaker 30) Fuel pumps isolating valve switch warning light 31) Engine starter switch 32) Oxygen contents gauge 33) 34) Oxygen regulator (F.1) 35) Engine starter master switch 36) Ventilator 37) Mk.17 oxygen regulator (not on F.1) 38) RATOG pushbutton 39) Flaps position indicator 40) GGS selector dimmer control 41) U/c pushbutton 42) Outside air temperature gauge 43) U/c position indicator 44) U/c pushbutton 45) Arrestor hook warning light 46) U/c warning light 47) Arrestor hook training switch 48) Arrestor hook control switch 49) Hood jettison control 50) 51) 52) Radio altimeter limit switches (F.1) 53) Fuel tanks fire warning light 54) GGS master and retraction switch 55) Gyro gun sight 56) GGS emergency lowering control 57) Hydraulic pressure failure warning light 58) Aileron trim power/manual selector switch 59) Aileron power/manual selector switch (not on F.1) 60) Aileron power engaged indicator 61) Jet pipe temperature gauge 62) ASR scope sight and control unit.

## Sea Hawk cockpit

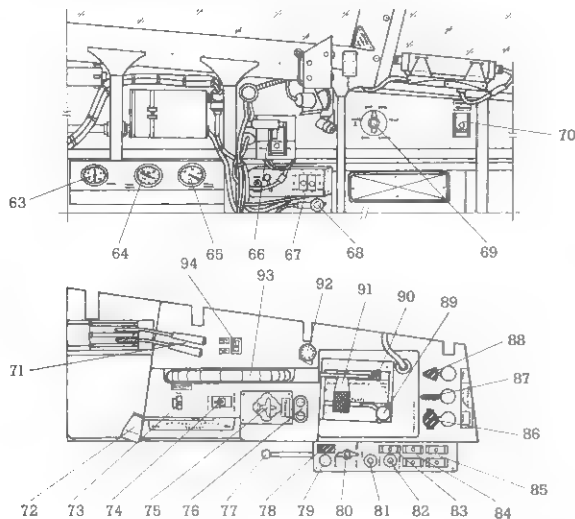


FGA/RR.101

FGA/RR.101

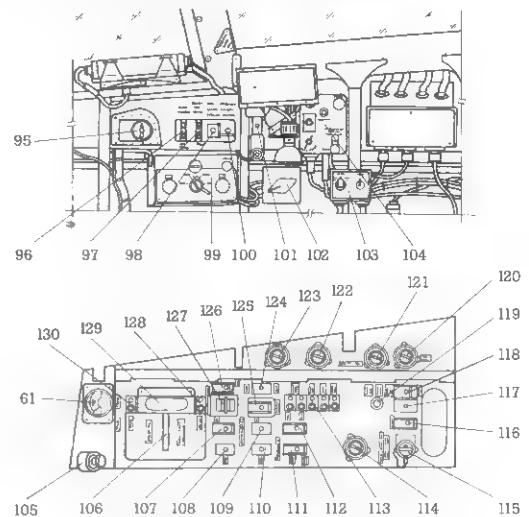


### Port side and console - all versions

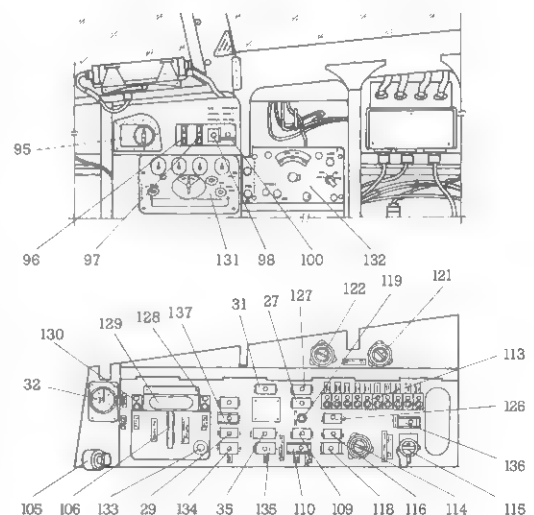


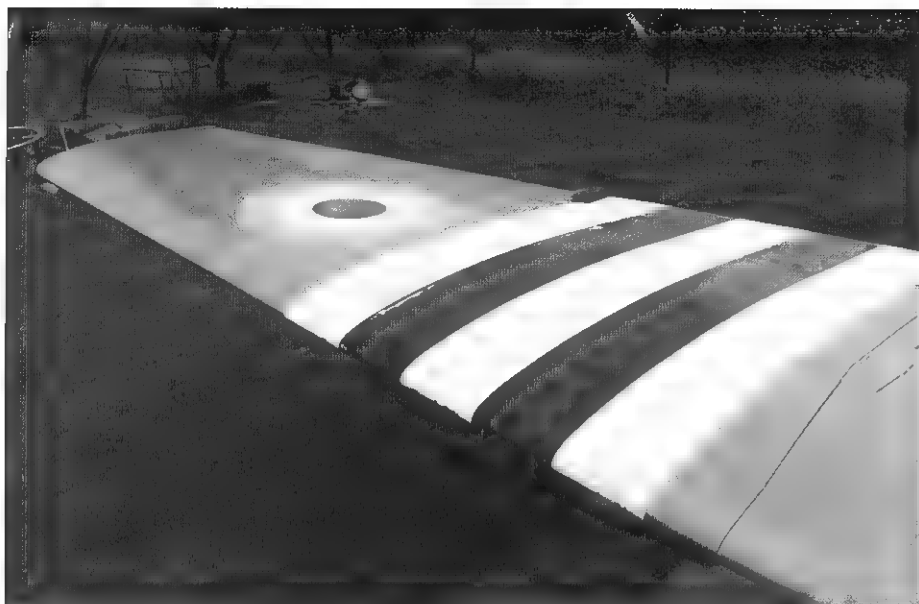
**Port and starboard sides:** 63) Flaps emergency air pressure gauge 64) Wheel brakes accumulator pressure gauge (F.1) 65) U/c and arrestor hook emergency air pressure gauge 66) Hood control switch and declutching control 67) IFF control 68) Wing fold warning light 69) Armament master switch 70) Wheel brakes override switch (F.1), GGS guns/RP switch 71) LP cocks levers 72) HP cock lever and relight button 73) Camera switch 74) Wing fold control switch (not on F.1) 75) Rudder and aileron trim control 76) Rudder and aileron trim position indicator 77) Cockpit heat control (not on F.1) 78) Bomb fuse warning light (not on F.1) 79) Bomb control panel fuse holder (not on F.1) 80) Bomb fusing switch (not on F.1) 81) 82) Bomb jettison pushbuttons (not on F.1) 83) Bomb distributor switch (not on F.1) 84) Inner bomb selector switches (not on F.1) 85) Outer bomb selector switches (not on F.1) 86) Flaps emergency control 87) U/c emergency control 88) Arrestor hook emergency control 89) Flaps control 90) Airbrakes control 91) Throttle lever and press-to-transmit switch 92) Throttle damper 93) Elevator trim control 94) Wing fold control switch (F.1) 95) Cockpit pressure control (not on early F.1) 96) Target release selector switch (not on F.1) 97) Target emergency release switch (not on F.1) 98) Red lamps master switch 99) VHF control unit 100) Emergency lamps master switch 101) Beam Approach switch (F.1) 102) VHF/ZBX mixer box 103) ARL 18049 control box (not on F.1) 104) ZBX control box 105) De-icing pump 106) Booster pumps selector switch 107) 108) Identification lights switches 109) 110) Navigation lights switches 111) Drop tanks jettison switch (F.1), inner pylon jettison/safe switch (other versions) 112) Aileron power/manual selector switch (not on F.1) 113) Circuit breakers 114) Port and starboard red lamps dimmer switch (not on F.1) 115) Fuel pump test socket 116) RATOG master switch 117) Ailerons power control switch (not on F.1) 118) Battery isolating switch 119) Ailerons power warning light 120) Port and starboard red lamps dimmer switch (F.1) 121) Instrument panel red lamps dimmer switch (F.1) 122) U/v lamps dimmer switch 123) Instrument panel red lamps dimmer switch (not on F.1) 124) 125) Signal discharger switches (F.1) 126) Cockpit pressure warning horn cut-out switch 127) Pressure head and camera heating switches 128) Rear booster pump circuit breaker 129) Booster pump warning light 130) Forward booster pump circuit breaker 131) UHF control unit 132) Radio compass control unit 133) Standby inverter start indicator 134) Standby inverter start switch 135) Identification light selector and Morse switch 136) Booster pumps test switch 137) Drop tanks fuel master switch.

### Starboard side and console - all versions except FGA/RR.101



### Starboard side and console - FGA/RR.101





Starboard wing with main spar hinge joint. Two dots outside the roundel indicate the position of a two-cartridge signal discharger (although not used in service). The location of the national insignia and Suez stripes is also well illustrated in this view.

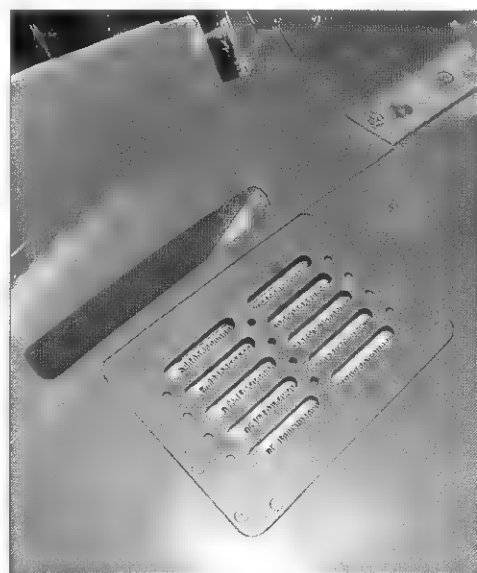
Folding wing hinge joints and a part of the split trailing edge airbrake (above)



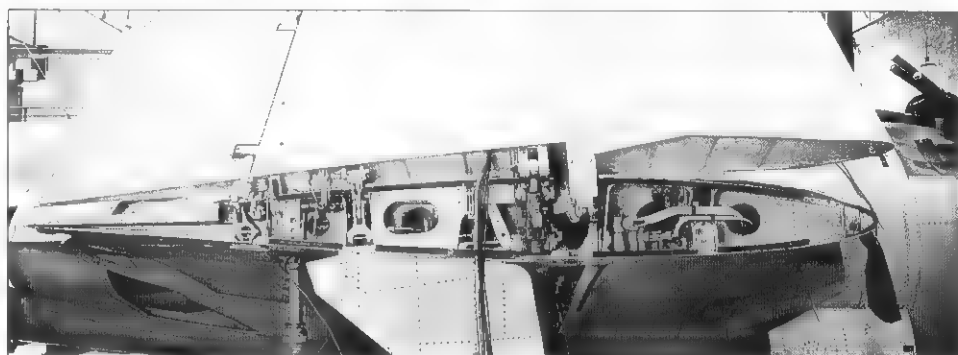
Port aileron and tab with operating arms and their control access panels (above).



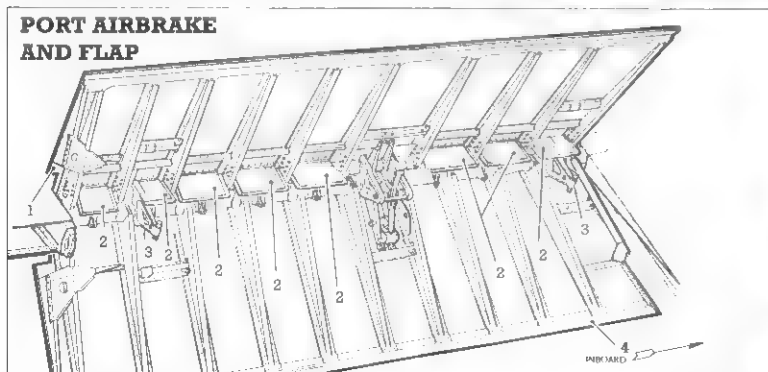
Boundary layer bleed air spill ducts in the wing roots - starboard side with generator cooling air intake (the scoop was fitted to Mk.3, 4, 5 and 6 aircraft), and port side with spill louvers of the air conditioning pre-cooler unit.

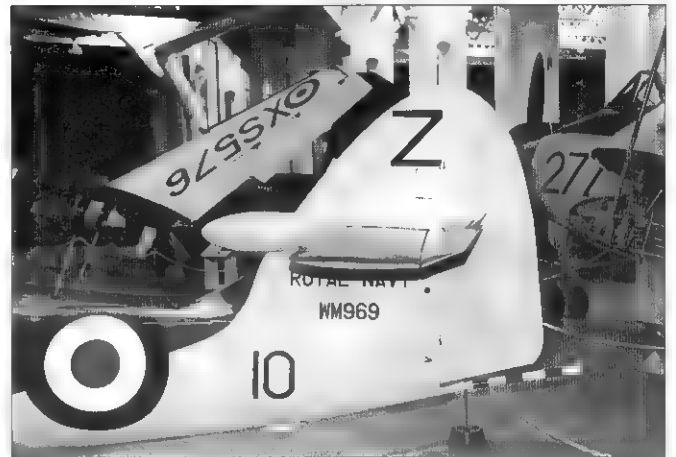


Folded wing exposes the folding mechanism with spar hinge joints, disconnected flap drive shafts, aileron control rods and other details (right). Centre fuselage jet pipe and thermo-couple doors viewed from below. In the wing fillet is a trapezoid inboard flap and inner segment of the trailing edge flap (bottom right).



Split trailing edge airbrake and flap: 1) Airbrake 2) Anti-buffet slot doors 3) Bearing brackets 4) Landing flap.

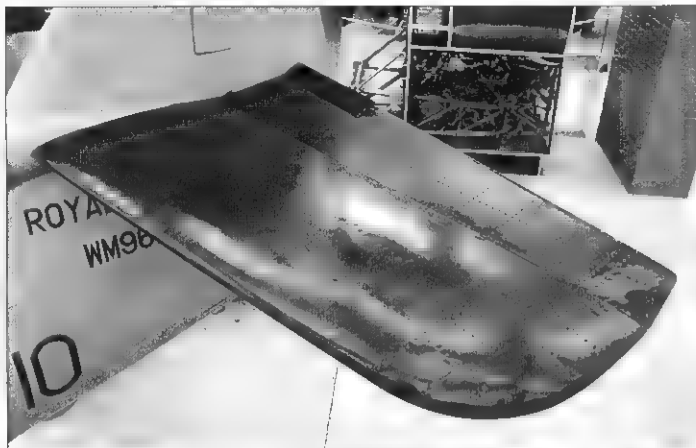




Aesthetically pleasing, curvaceous contours of the Sea Hawk's vertical tail surfaces (above) and rear fuselage, dorsal fin and rudder detail (below). The bulge forward of the arrestor hook fairing is a tail bumper (on F1 aircraft placed further aft). Diaphragm below the tailplane, navigation light and flying control access panels are clearly visible in this view.



Federal German Navy Mk.100/101 aircraft differed externally from FGA Mk.6 with a bigger tailfin and slightly smaller rudder (top and above). The fin area was increased by 12 per cent compared to the FAA Sea Hawks.



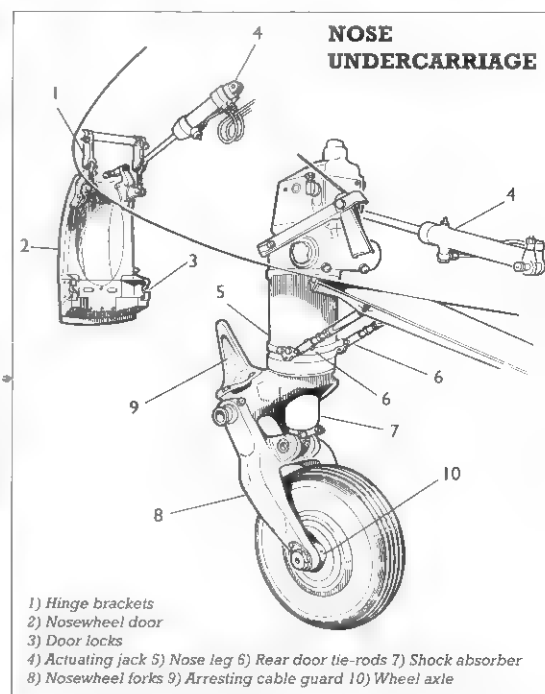
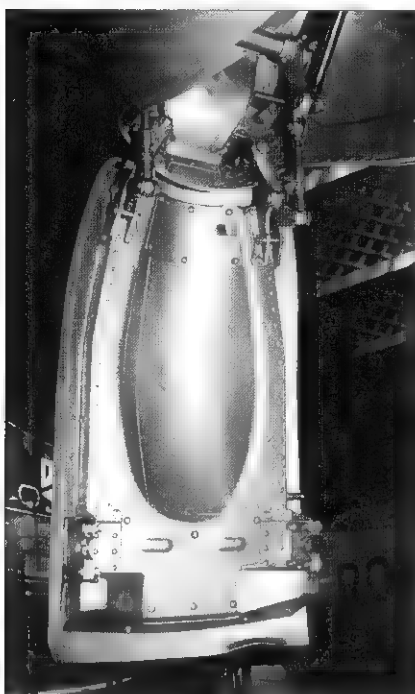
Tailplane bullet fairing improved the control and stability of the aircraft (above); note the stencilling and colour demarcation line on the lower tailplane surface. Port tailplane and elevator upper and lower views (above left and left).







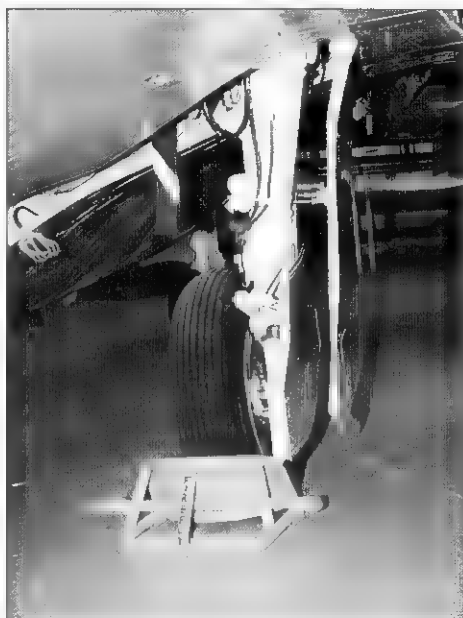
Port and starboard views of the Dowty nose undercarriage leg with its prominent arresting cable guard, leg door and forward retracting nosewheel with Dunlop D.R.2820 tyre. The nosewheel unit was pivoted at front fuselage frame No.2 (left and centre). A carrier approach light in the nosewheel door was added to many aircraft later in their service career and became standard for the export variants - Mk.50, Mk.100/101 and the Indian Sea Hawks (right).



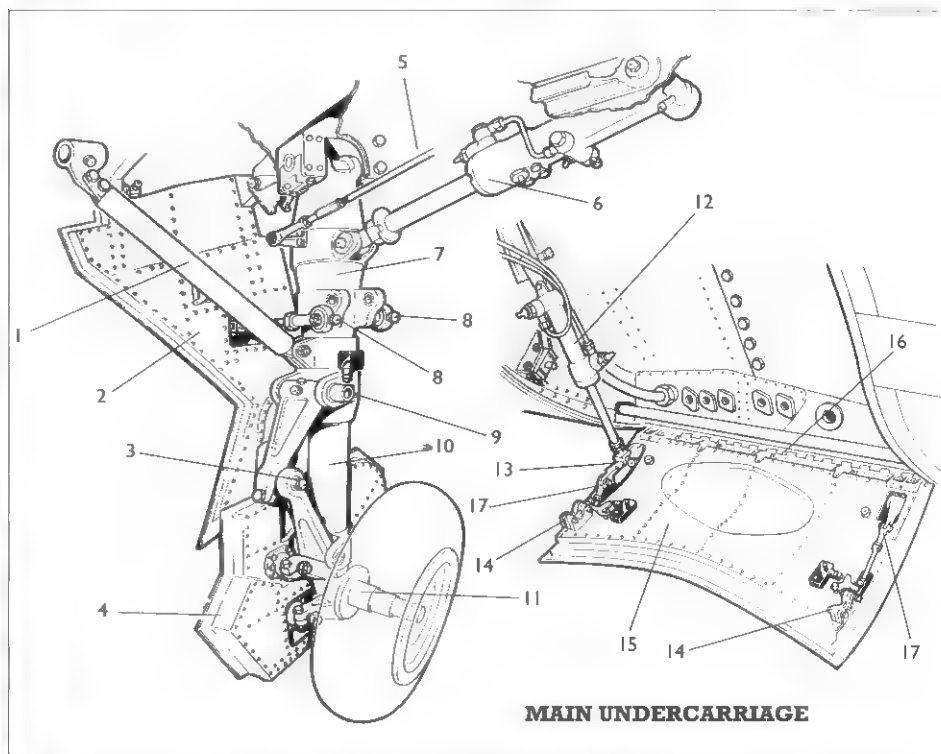
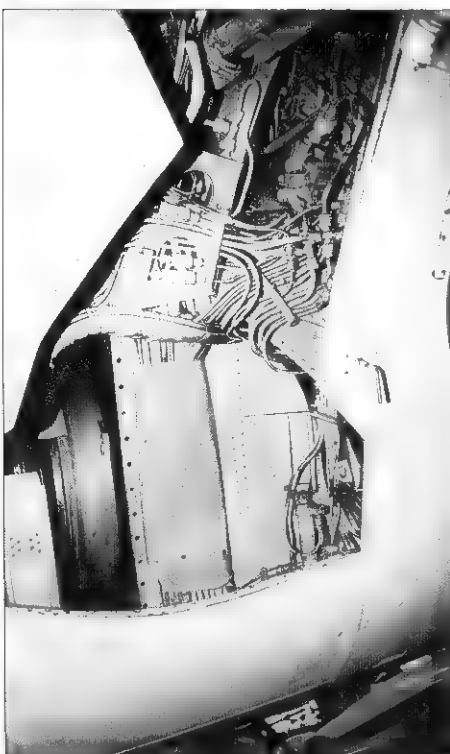
Nosewheel door inner side shows the recess for the wheel and details of door hinge brackets, door-operating levers, actuating jack attachment and locks (left). Rear section of the nosewheel bay with the leg pivot hinge and offset ram air pipe (centre).



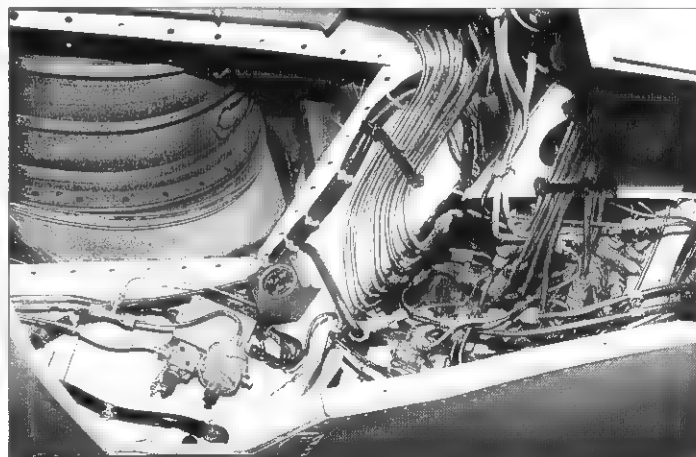
Port side of the nosewheel bay (above). A G.45 cine camera was normally mounted on the plate in the centre. Its absence, however, enables the ram air pipe and the circular combined valve unit to be visible at the top. The air conditioning system piping and ground test connection cap are located below. The casting on the left is a ballast weight. The starboard side shows the front door jack, cold air unit and junction box J.B.7. Just visible is a filler cap of the de-icing system fluid tank on the right hand side.



Dowty type E.8777 main undercarriage, starboard (left and centre) and port unit (right). Two-piece wheel well fairings were attached to the leg by adjustable connecting rods. The small rectangular door in the outer fairing gave access to the wheel jacking points.



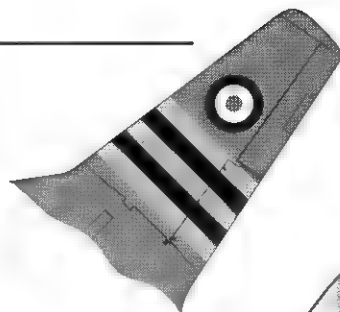
**Main undercarriage:** 1) Radius rod 2) Upper fairing 3) Torque links 4) Lower fairing 5) Teleflex control 6) Undercarriage jack 7) Upper cylinder 8) Upper fairing connecting rods 9) Main undercarriage leg 10) Lower cylinder 11) Wheel axle 12) Wheel door jack 13) Door jack attachment 14) Door lock 15) Undercarriage door 16) Door piano hinge 17) Lock operating rod



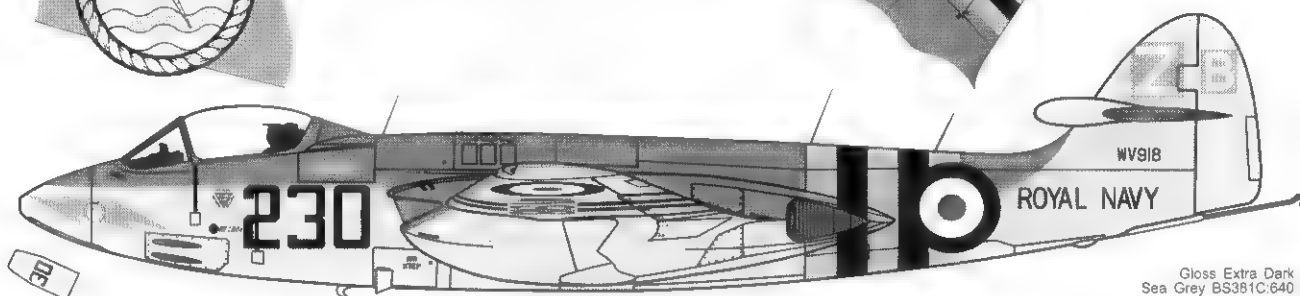
Port wheel bay, looking forward. Under the oblong cover there are airbrake and flap circuit pipes, while on the front wall is a set of clamped pipes enabling undercarriage gear, wheel brake and wing fold operation. Just touching the bay edge on the right is a RATOG release unit spring door (left). The same bay centre section, with its abundance of pipes and associated control, relief and shuttle valves. On the rear wall is an air filter, charging valve and Mk.14KK pressure gauge of the anti-G air system. The exhaust unit visible on the left was normally separated from the bay by a cover (right).



No.810 Squadron badge set on a red lightning flash has blue and white sky and waves, white clouds and gold lightning outlined in black. Crest surround is gold and black



Roundel and stripe positioning on upper wing surface



**Sea Hawk FGA Mk.4, WV918/230-Z-B**  
**No. 810 NAS, HMS Albion (alternately HMS Bulwark), 'Operation Musketeer', November 1956**  
 Extra Dark Sea Grey and Sky finish in accordance with No.2 pattern. White code letters in red squares with 'Z' on tailfin and 'B' on rudder on both sides. Numerical code, letters and serials in black. Suez stripes around fuselage and wings - those below wings are interrupted to allow visibility of underwing serials.



Suez stripe location on lower wing surface and grey leading edges on lower and tailplane surfaces

No. 807 Squadron panther is black with white detail, red mouth and tongue



Gloss Extra Dark Sea Grey BS381C:640

Gloss Sky BS381C:210

Bright Red BS381C:138

Yellow BS381C:356

Bright Blue BS381C:108

Burnt Metal

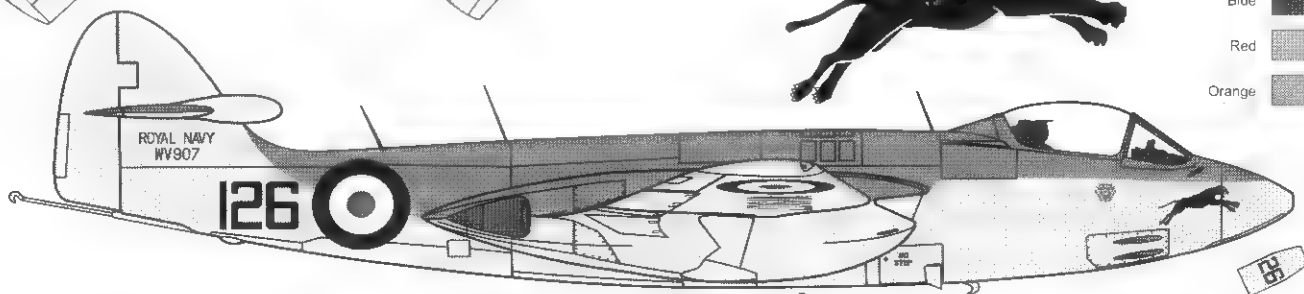
White

Black

Blue

Red

Orange



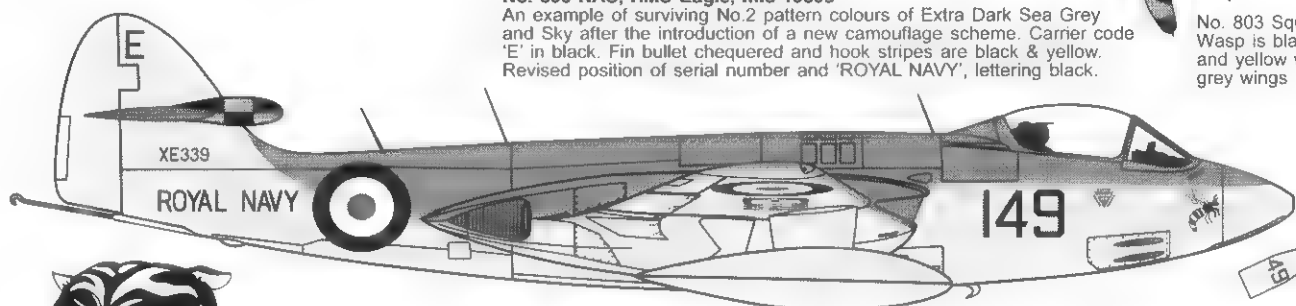
'DANGER' warning triangle is red and white

**Sea Hawk FGA Mk.4, WV907/126**  
**No. 807 NAS, HMS Albion, 1955**  
 Standard colour finish with all markings in black. The uppersurface colour does not return under leading edge of wing and tailplane. Black panther on nose leaps always forward.



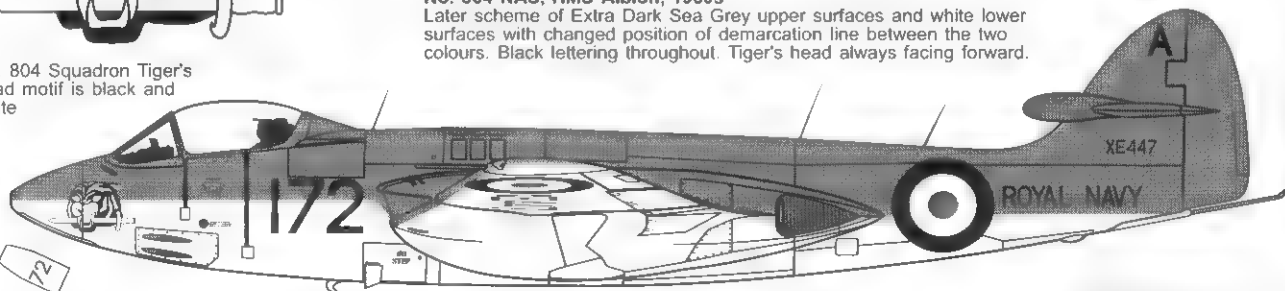
No. 803 Squadron Wasp is black and yellow with grey wings

**Sea Hawk FGA Mk.6, XE339/149-E**  
**No. 803 NAS, HMS Eagle, mid-1960s**  
 An example of surviving No.2 pattern colours of Extra Dark Sea Grey and Sky after the introduction of a new camouflage scheme. Carrier code 'E' in black. Fin bullet chequered and hook stripes are black & yellow. Revised position of serial number and 'ROYAL NAVY', lettering black.

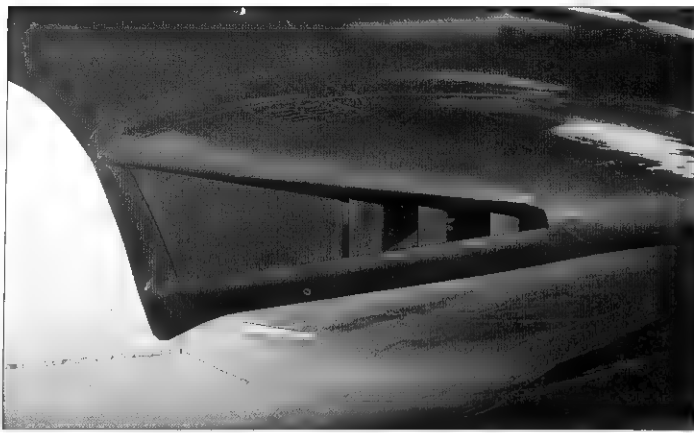


No. 804 Squadron Tiger's head motif is black and white

**Sea Hawk FGA Mk.6, XE447/172-A**  
**No. 804 NAS, HMS Albion, 1960s**  
 Later scheme of Extra Dark Sea Grey upper surfaces and white lower surfaces with changed position of demarcation line between the two colours. Black lettering throughout. Tiger's head always facing forward.







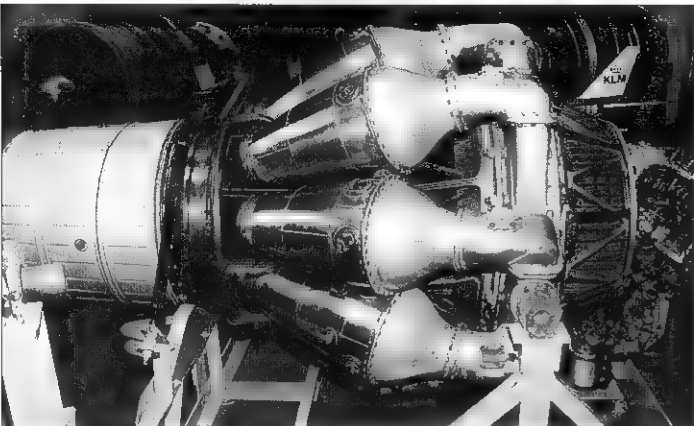
Port stub wing air intake with boundary layer splitter plate and duct flow vanes. Note the camouflage demarcation line.



Cartridge starter exhaust and plenum chamber cover with spring-loaded flaps of the compressor air supply.



Jet pipe exhausts discharging through the stub wing trailing edge required the design of characteristic "pen-nib" fairing (left and above).

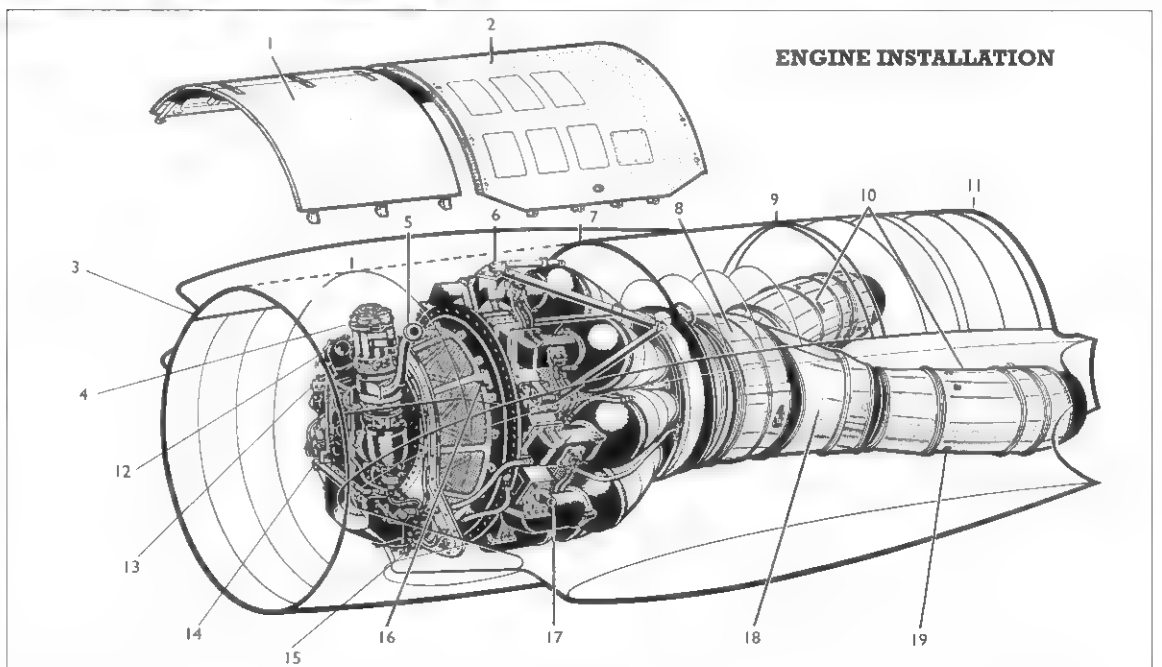


Rolls-Royce Nene II axial flow gas engine shows the combustion chambers with centrifugal compressor casing and intake filter screens at the front end.

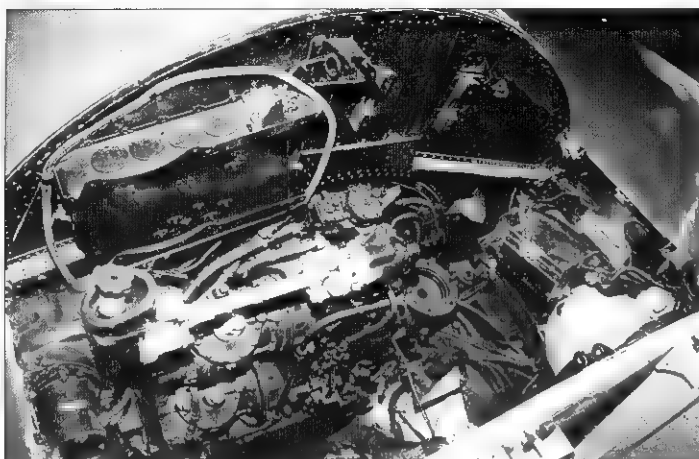


Torch-lit view through the transition section of the jet pipe to the engine turbine and distribution system (above).

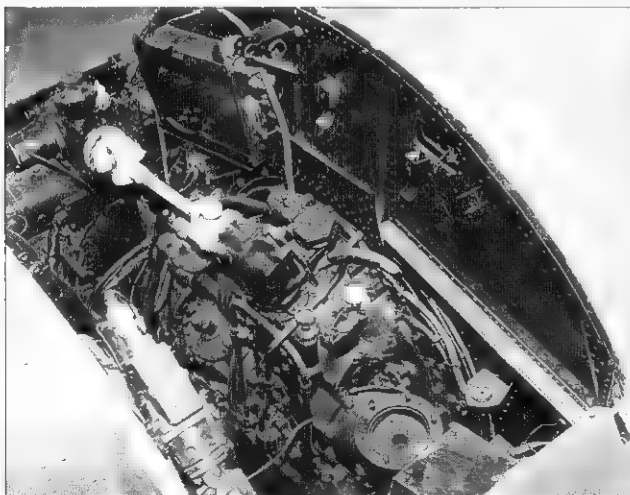
**R-R Nene II engine installation and covers:** 1) Accessory bay doors 2) Plenum chamber door 3) Frame No. 12B 4) Engine starter unit 5) Starter exhaust pipe 6) Engine mounting 7) Front spar 8) Exhaust unit 9) Rear spar 10) Bifurcated jet pipes 11) Frame No. 28 12) Accessories drive 13) Fuel pump 14) Throttle valve 15) H.P. fuel cock 16) Lifting shackle 17) Transit stand mounting trunnion 18) Transition section 19) Jet pipe temperature coupling



## ENGINE INSTALLATION



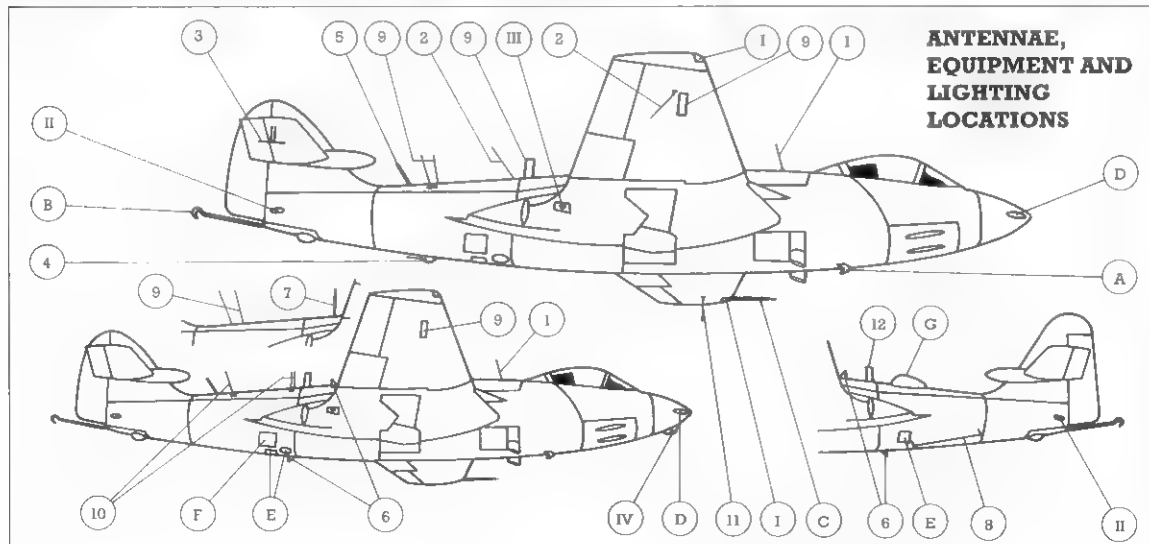
The radio and engine accessory bay was situated between frame Nos. 12B and 14. Rear wall shows the engine wheelcase, Rotol accessories gearbox drive and its oil filler cap. The light coloured bottle on the right-hand side is a hydraulic fluid reservoir. The empty space below ■ was normally occupied by two accumulators (left). Centre fuselage front wall: cabin isolation valve and air conditioning pipes are on the port side, while the junction box J.B.3 and electrical cables are located on the right. In the centre is a mounting bracket for the extinguisher bottle (right).



The plenum chamber diaphragm above the engine wheelcase, with empty racks for the ZBX radio on the wall (left). The Plessey cartridge starter is also removed, leaving only the circular mounting at right. Two-piece accessories bay doors, inner side (above).



The early IFF blade antenna, which appeared on the fuselage top of Mk.1 and 2 aircraft (above). The later installation of VHF and UHF aeriels, here on the Sea Hawk FB Mk.5 (right).



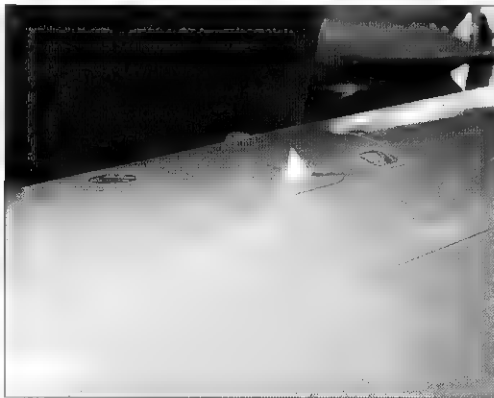
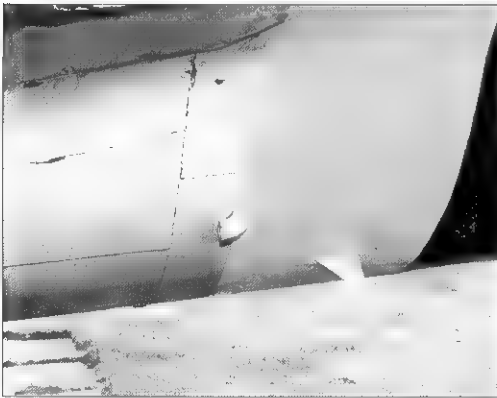
**Antennae:** 1) ZBX radio (not on FGN and IN a/c) 2) VHF radio 3) A/F radio altimeter, both tailplanes (F1 only) 4) Beam Approach aerial (F1) 5) IFF rod antenna (F1, 2) 6) IFF blade antenna (FB.3/5, FGA.4/6, 50, 100, FGA/RR.101) 7) IFF rod antenna (some IN FGA.6) 8) ADF sense (FGN and IN a/c) 9) UHF radio 10) UHF radio set (FB.5, late FGA.6) 11) UHF standby (some FGA.4/6) 12) UHF/VHF radio (FGN a/c)

**Equipment:** A) Catapult hook B) Deck arrester hook C) Pilot tube D) Gun camera, port side only E) Reconnaissance camera windows F) Access to radio and reconnaissance cameras G) Directional loop antenna radome (FGN and IN a/c)

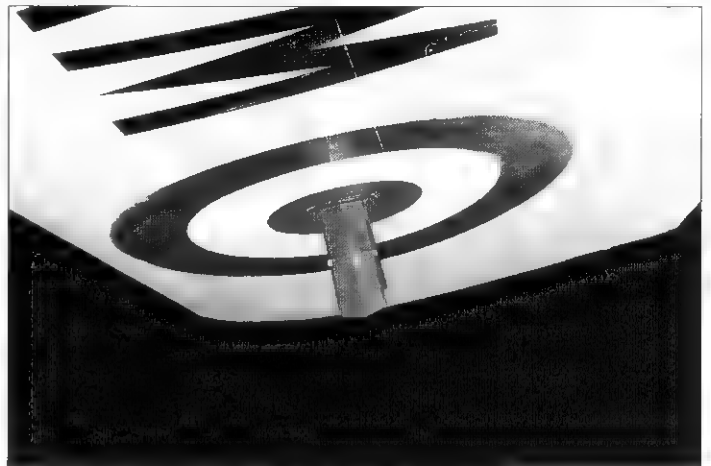
**Lighting:** I) Navigation light II) Rear navigation light III) Downward identification light, stbd side only IV) Carrier approach light (FGA.6, 50, 100, FGA/RR.101)



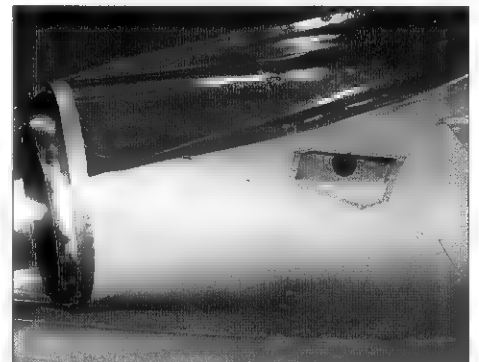
Sea Hawk FB Mk.8, alias the Dutch FGA Mk.50, retains its original British antennae – the UHF set (left). The Mk.100/101 aircraft of the German and the Indian Navy are easily recognisable by their Philips UHF/VHF radio blade antenna and the rear fuselage directional loop antenna radome (right).



IFF (Identification Friend or Foe) triangular blade antennae replaced the early rod-type IFF aerial in the rear fuselage. The small curved pipe is a radio and equipment bay ventilation scoop (left and above). Export machines had the Philips radio antenna mounted in the rear fuselage section between frame Nos.29 and 30. It was also retrofitted to remaining FAA Sea Hawk FGA.4/6s in service (right).



Standby UHF antenna, located beneath the port wing and Pitot tube in the wing tip leading edge (left). The lower UHF antenna, mounted under the starboard wing (right). Note that the antenna is painted in the same colour as the section of the roundel (compare with the photo on p. 19).



Port wing tip fairing with navigation light and Pitot tube mount (left). Starboard rear navigation light, rudder control rod and flying control access panel (centre) and a red identification light situated only in the starboard stub wing root fillet (right).

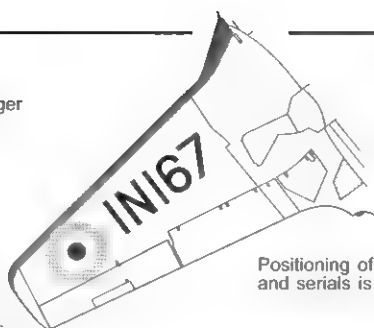




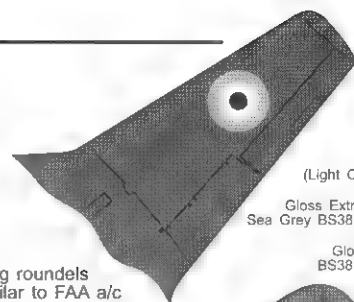
INAS 300 leaping Tiger is cream with black detail

**Sea Hawk FGA Mk.6, IN167/W**  
No. 300 INAS 'White Tigers', Indian Navy, INS Vikrant, 1970s

Extra Dark Grey and White finish similar to that applied on FAA aircraft. Black lettering with Indian roundels in six positions.



Positioning of wing roundels and serials is similar to FAA a/c



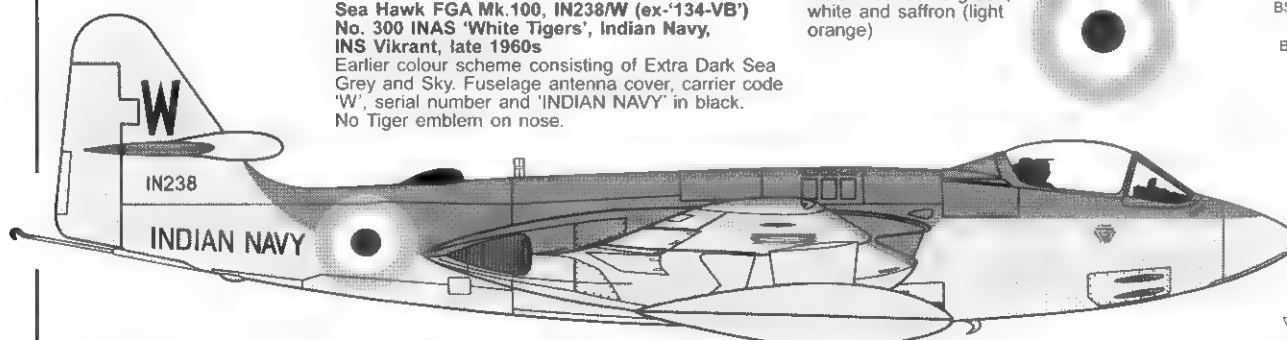
Saffron (Light Orange)  
Gloss Extra Dark Sea Grey BS381C:640  
Gloss Sky BS381C:210



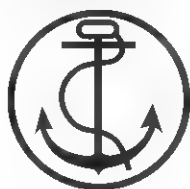
**Sea Hawk FGA Mk.100, IN238/W (ex-'134-VB')**  
No. 300 INAS 'White Tigers', Indian Navy, INS Vikrant, late 1960s  
Earlier colour scheme consisting of Extra Dark Sea Grey and Sky. Fuselage antenna cover, carrier code 'W', serial number and 'INDIAN NAVY' in black. No Tiger emblem on nose.

Indian roundel is green, white and saffron (light orange)

Bright Red BS381C:138  
Yellow BS381C:356  
Bright Blue BS381C:108  
Burnt Metal  
White  
Black  
Green  
Orange



Federal German Navy Anchor is painted in black on camouflage background



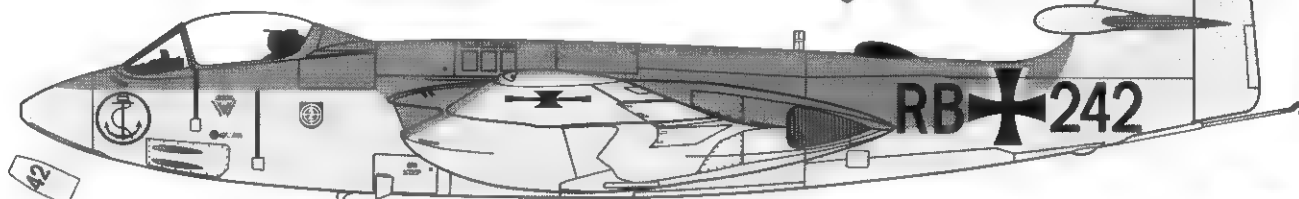
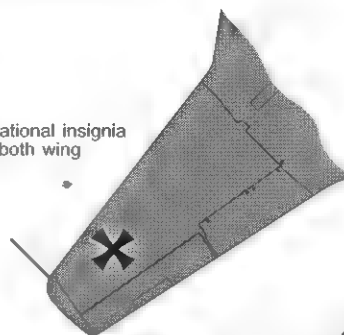
MFG 2 badge shield is blue and white with yellow sight

Location of national insignia is similar on both wing surfaces



Federal German Cross is black outlined in white

**Sea Hawk FGA/RR Mk.101, 6689/RB+242**  
MFG 2, Federal German Navy, Schleswig-Tarp (Eggebek), 1965-66  
Earlier standard FAA colour finish of Extra Dark Sea Grey on upper surfaces and Sky on lower surfaces. Fin flash is black, red and yellow. Unit badge on both tailfin and front fuselage. Code, anchor and inscription below fin flash in black. Starboard code reads 'RB+242'.



No. 860 Sq. Wings and fist are grey and black, and lightnings are gold, all on blue and white sea and sky. Anchor is brown and black and crest surround is in gold

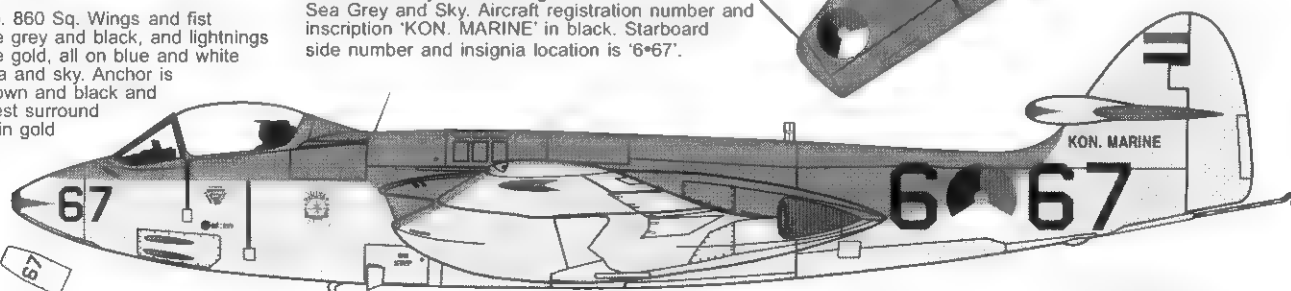
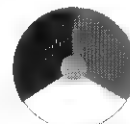


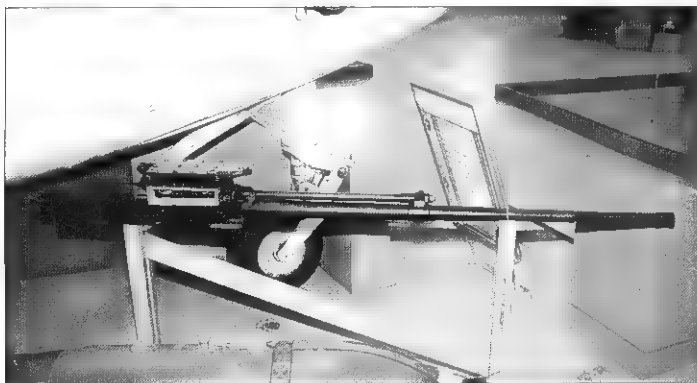
'VORSICHT' warning triangle is red and white

Wing roundel location; upper and lower surfaces identical

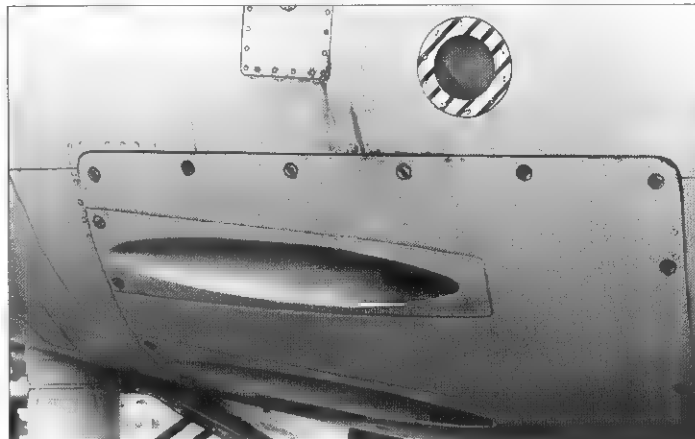
**Sea Hawk FGA Mk.50, 6638 (ex-XL310)/6-67-67**  
No. 860 Sq. Dutch Naval Air Service, HrMS Karel Doorman, 1958-59  
Earlier FAA-style camouflage colours of Extra Dark Sea Grey and Sky. Aircraft registration number and inscription 'KON. MARINE' in black. Starboard side number and insignia location is '6-67'.

Dutch roundel is blue, red and white with orange centre spot

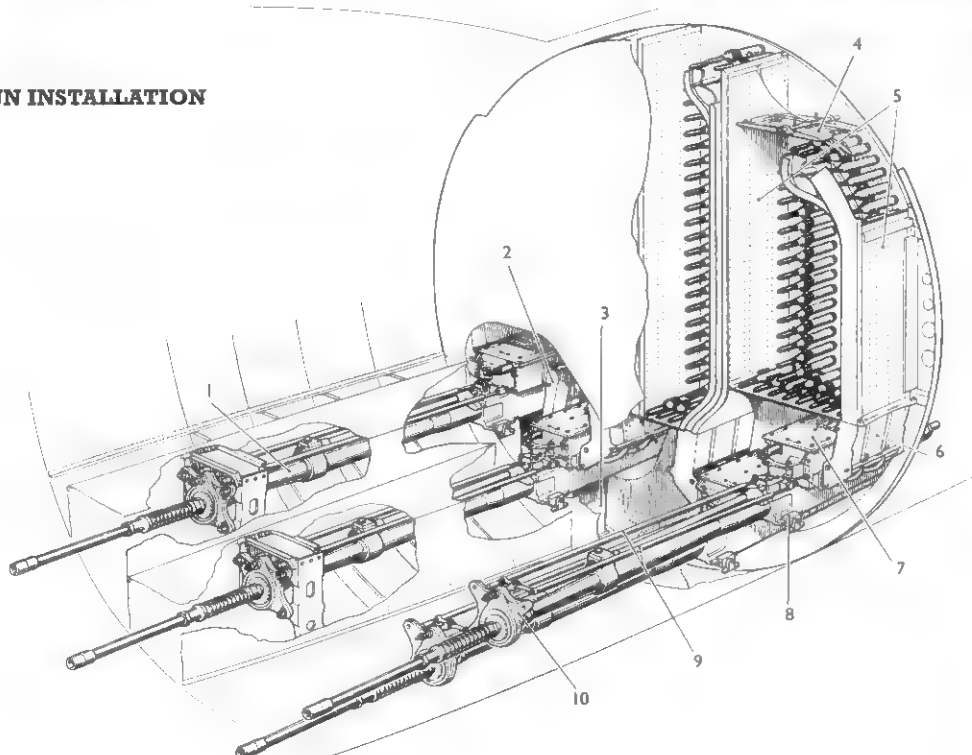




A loose 20mm British Hispano Mk.V cannon with gas cylinder housing above the barrel (above) and the gun muzzle blast through in the port side of the fuselage (right). Note the external hood release window.



## GUN INSTALLATION

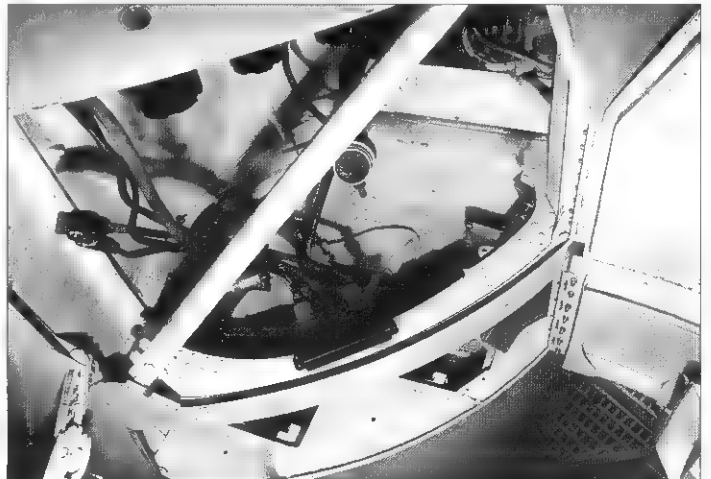
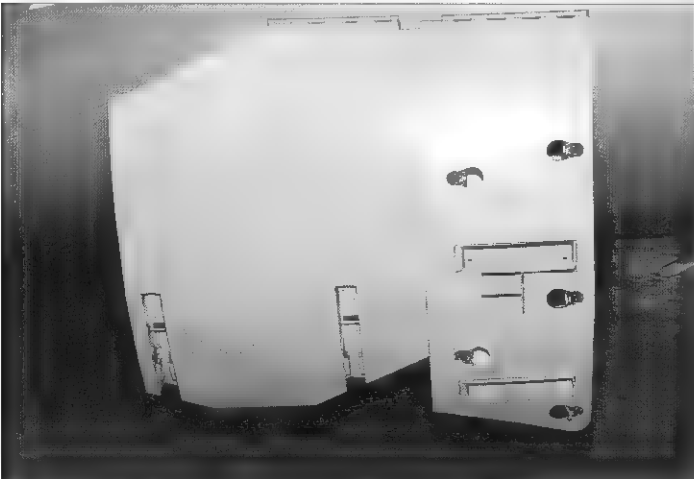


At the top of the page, the Sea Hawk FGA Mk.6, XE456, was a demonstration and trials aircraft evidenced by the 'Hawker Siddeley Group' emblem on the nose. This aircraft had been displayed at the SBAC Exhibition at Farnborough in September 1956 and is seen here with diverse underwing stores of two 75-gal drop tanks, two 500lb bombs, six 25lb (port side) and four 60lb rocket projectiles.

**Gun installation and ammunition tanks:**  
 1) Hispano Mk.V cannon  
 2) Empty link chute 3) Empty case chute 4) Outer tank lid 5) Feed necks 6) Detachable feed neck 7) Belt feed mechanism 8) Rear mounting 9) Tie-rods 10) Front mounting



Ammunition boxes located at frame No. 12 housed 200 rounds per gun. The sprocket spindles and box lids secured the ammunition belt during its travel to the feed mechanism (left). Front fuselage bottom with used chain link case and cartridge outlets. The accelerated take-off hook is in a lowered position (above).



Divided starboard rear gun bay doors with chain link and cartridge outlets. Note the piano hinge, flush fastener grips and case locks (left). The same gun bay interior; the cannons are removed leaving disconnected electro-pneumatic piping. There is a gun junction box on frame No. 12B and, just visible, are three caps of the external hydraulic supply valves (right).

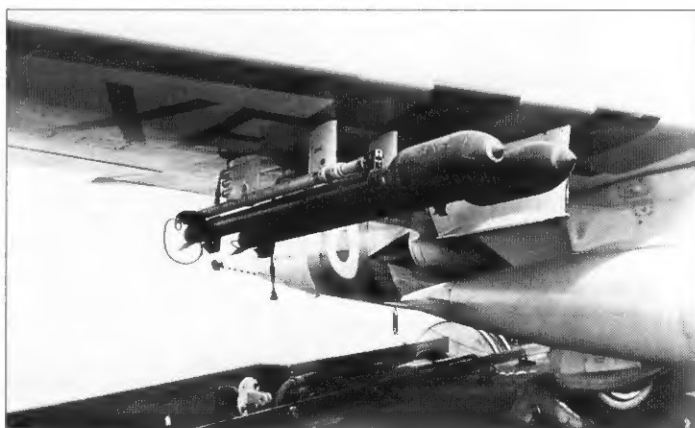


Starboard gun bay structure with rear gun mountings. The upper gun ammunition feed neck is visible at the top (left). Inner side of the two-piece gun bay doors shown: the front part has the chain link and cartridge ejection necks (centre), while the rear part has two hollows for the gun breech mechanism (right).





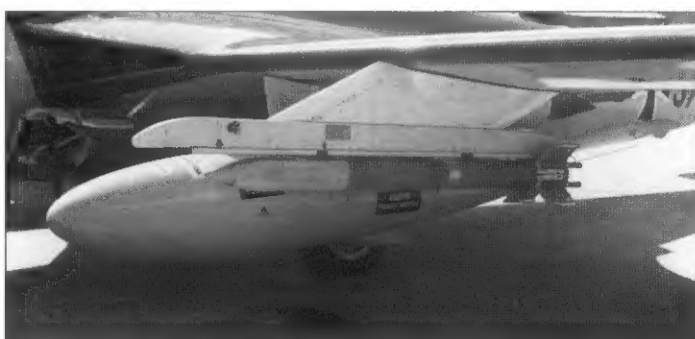
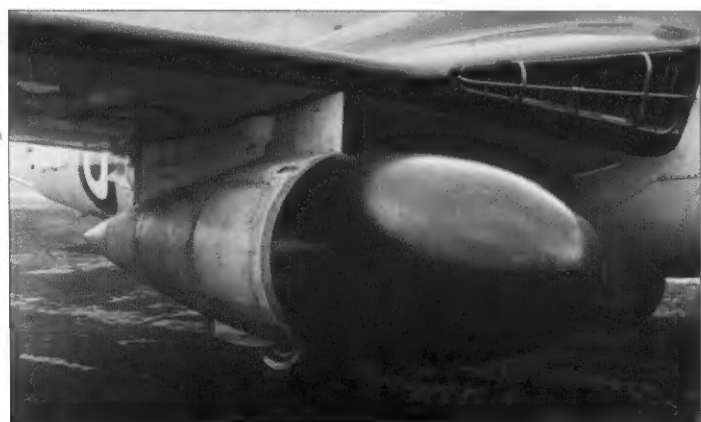
Re-arming and refuelling the Sea Hawk - of note is the fitting of the small calibre bomb carrier amongst the RP rails (left). Radar reconnaissance Mk.101 with a full load of three underwing drop tanks and the Ekco radar pod just visible on the starboard side beneath the fuselage contour (right). The 'Excelsior' banner (target) streaming device was developed for high-speed target practice at No.802 Sq. at Lossiemouth in 1954 for use on FGA Mk.4 aircraft (below left).



Assortment of unguided 3" rocket projectiles - 60lb and 25lb (above and two photos below left) on British and German aircraft. Note the rail attachment details and wiring in the photo above.

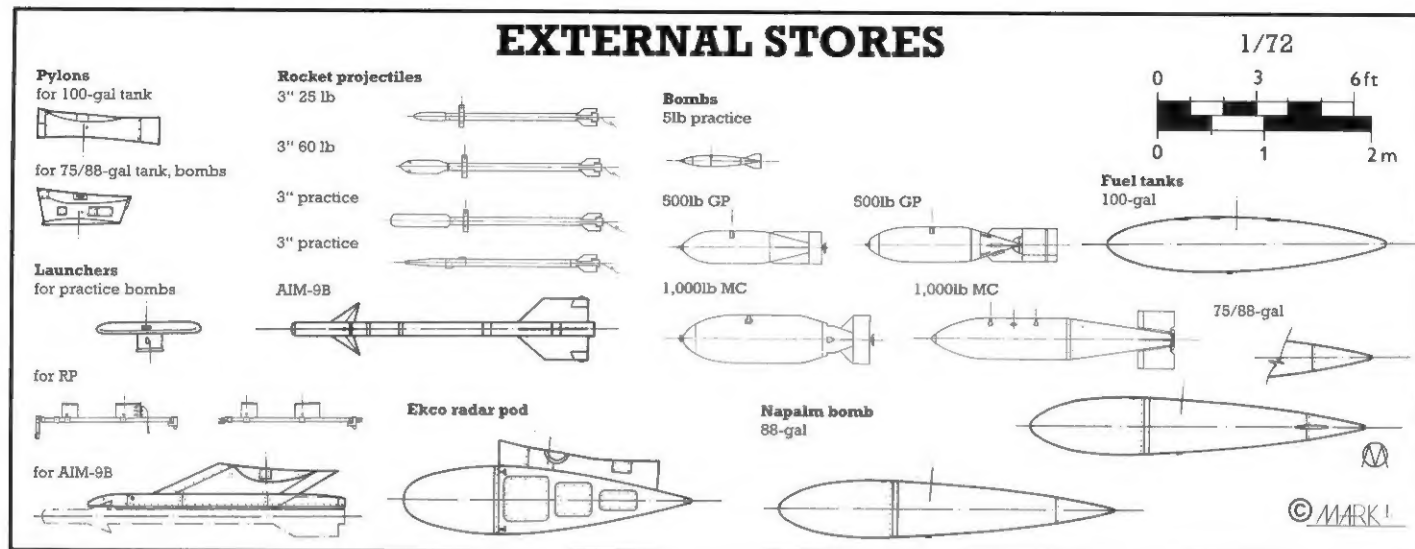


540lb (245.2kg) medium capacity practice bomb with the igniter and wiring in place (above).



Sea Hawk Mk.101 had provision to carry an Ekco 38B search radar in a pod mounted on the starboard inboard wing pylon (left). A 70mm air-to-ground rocket experimentally fitted to the Mk.101 wing launching rail (above).

## EXTERNAL STORES



## Armament and equipment

The primary role of the Sea Hawk was carrier-borne intercepting, for which it was equipped with a built-in armament of four fixed gas-operated 20mm British Hispano Mk.V cannons, housed in pairs on the port and starboard sides of the fuselage nose, below the cockpit floor. The built-in ammunition boxes for 200 belt-fed rounds per gun were located in a vertical position aft of the gun bays (FB.3/5 and FGA.4/6 aircraft normally carried only up to 600 rounds altogether). The guns were fired electrically by a trigger on the forward face of the control column. For gun sighting a Ferranti produced Mk.4E gyro gunsight was used. In case the pilot had to abandon the aircraft in an emergency it automatically retracted when the hood was jettisoned. Sight and firing documentation was made available by using both the CGS recording camera (fitted over the hood of the gunsight) and Williamson G.45 cine camera (installed in the port side of the fuselage nose).

With the introduction of the Mark 3 aircraft a new fighter-bomber role was attributed to the Sea Hawk. Two 500lb (227kg) GP or MC bombs, mines, sonobuoys or Napalm bombs could be carried on the inner wing pylons. The bomb load was increased even more in the ultimate, pure ground attack version, the FGA.4. Two additional wing strong points were provided to enable the carriage of more 500lb bombs or two 1,000lb (454kg) MC bombs. For training a practice bomb carrier for two practice bombs (e.g. 5lb, 20lb/2.3kg, 9.1kg bomb) could be attached to the wing pylons (inner and/or outer wings). Instead of the outer pylons multiple launchers for up to thirty 3" (76mm) 25lb (11kg) or twenty 60lb (27kg) head RPs or concrete practice RPs could be installed. Maximum loading of twenty 5" (127mm) rocket projectiles and various bomb/RP combinations were also possible. With new air-to-air missiles available from the USA, some Dutch Sea Hawks were adapted during 1959 to carry two Philco/Ford Sidewinder I A missiles (AIM-9A), one under each special wing pylon. The same installation for AIM-9B AAM was test mounted on a German Mk.101 aircraft (RB+375) along with a 70mm air-to-ground rocket, the former below the starboard and the latter below the port wing.

Fighter or fighter-bomber long range or endurance capabilities were improved by the additional fuel capacity provided by drop tanks carried on the inner wing pylons. The F.1s used oval section 100-gal (455 litre) tanks, while later Mark aircraft utilised either 88-gal (400 litre) steel or 75-gal (341 litre) plastic Bristol drop tanks of a circular section. For ferrying and long range patrols (mostly German Navy aircraft) four tanks were carried.

The batch of FGA/RR.101 all-weather fighters supplied to the FGN possessed provision to carry an Ekco 38B air search radar in a drop tank-like pod under the starboard inner wing pylon. When the ASR equipment was removed and a CGS installed, the Mk.101 fulfilled the role of an FGA.100. Sea Hawks modified for target towing could tow either 30ft (9m) banner targets, banners released from the Excelsior

target streaming unit or Dart targets. For banner targets single or twin release units were fitted beneath the fuselage or the banner could be towed from the arrester hook by means of a special attachment. The Excelsior target device was developed for use on FGA.4 aircraft and consisted of a fluid fly wheel and a drum carrying the towing wire (fitted to the inner wing pylon), while the banner was carried in a tube with a slip mechanism (installed under the nearest RP launcher). Dart targets, attached to loops stretched between the poles, were picked-up by extended hooks during a low-level flight.

Airborne radio installation comprised VHF transmitter-receivers (1934 and 1935 radio relay units in the rear fuselage and associated whip aerials on the fuselage spine on frame No.29 and below the starboard wing respectively), a ZBX radio (ARI.5307) located in the engine accessories bay on the forward face of frame No.14 and a Beam Approach (A.1271) navigation device installed in the lower rear fuselage. The BA, with a horizontal antenna in a small bulge under the fuselage, was used on F.1 and F.2 aircraft. The VHF set was replaced by a UHF radio in FGA.4/6 (with main and standby sets) and was recognisable by blade antennae instead of the whip aerials. A number of FB.5 and late FGA.6s had their UHF radio upgraded. 'Green Salad' or 'Violet Picture' installations were also fitted with VHF and UHF respectively. The FGA.50 differed in having the Philips UHF radio with blade and whip aerials and their ZBX radio was retained. German Sea Hawk Mk.100/101s had the same UHF installation, but lacked the ZBX, and had a radio compass added. Its directional loop antenna, covered by a blister, was placed on the fuselage spine, while an ADF sense was mounted on the lower port side of the rear fuselage. The ZBX radio was also removed from Indian Navy aircraft.

Provision was made for IFF equipment on all the Sea Hawks and its early installation was associated with a narrow-chord blade antenna on the rear fuselage (on F.1/2), while subsequent Marks had two small triangular blade antennae fitted on the upper and lower fuselage (type ARI.5848). These ones were retained on export machines as well, except the Indian FGA.6s, which had a simple rod antenna instead.

Photo reconnaissance equipment, fitted by Special Order Only, was in the form of two Williamson F.24 aerial cameras mounted for vertical and oblique photography (the latter was possible from either side of the fuselage). A trial installation of a forward-facing F.94 camera in the adapted drop tank was carried out on FB.3 and FGA.4 aircraft in 1955, but the scheme was not introduced into service.

To shorten the aircraft's take-off RATOG could be installed on both sides of the lower centre fuselage (4 rockets on each side) and was automatically released when the undercarriage was raised.

Signal discharger equipment was located in the starboard outer wing, but its usage was restricted for early service period only and it was not used on F.2 and higher Marks. Other equipment included anti-G equipment (fitted to Mk.2 to Mk.6 aircraft), locking ropes for aeroplane controls, a K-Type dinghy and a Type J pack incorporated in the ejection seat. ■



Splendid view of at least ten Sea Hawks lined up with their engine cartridge starters fired. The aircraft are FB Mk.3s of No.806 NAS from HMS Centaur visiting the Royal Naval Air Station at Hal Far, Malta, some day in the latter half of 1954. The aircraft that has just taken off in the background is a Short Sturgeon TT Mk.3 of No.728 Squadron.

# EXTERNAL STORE VARIANTS

F.1  
F.2  
FB.3/FB.5  
FB.4/FGA.6  
FGA.50  
FGA.100  
FGA/RR.101

					○	○						●	●						2 x 100-gal fuel tank
□	□	□	□	□	○	○	□	□	□	□	□		●						2 x 100-gal fuel tank, 10 x 25lb RP
□	□	□			○	○			□	□	□			●	●	●	●		□ x 88-gal or 75-gal fuel tank, 6 x 25lb RP
□	□	□	□	□	○	○	□	□	□	□	□			●	●	●	●		2 x 88-gal or 75-gal fuel tank, 10 x 25lb RP
□	□	□	□	□	○	○	□	□	□	□	□		●	●	●	●	●		2 x 500lb bomb, 10 x 25lb RP
□	□	□	□	□	○	○	□	□	□	□	□			●	●	●	●		□ x 88-gal or 75-gal fuel tank, 30 x 25lb RP
	□	□	□	□	○	○	□	□	□	□	□				●	●	●		2 x 500lb bomb, 16 x 60lb RP
□	□				□	□				□	□			●	●	●	●		4 x practice bomb, 4x 25lb RP
			□	□	○	○		□							●	●	●		2 x 88-gal or 75-gal fuel tank, 4 x practice bomb
□														●	●	●	●		4 x 20lb practice bomb
□	□	□			○	○		□	□	□	□				●	●	●		2 x 88-gal or 75-gal fuel tank, 6 x 60lb RP
□	□		○		○	○		○		□	□				●	●	●		2 x 88-gal or 75-gal fuel tank, 2 x 500lb bomb, 12 x 25lb RP
□	□		○		○	○		○		□	□				●	●	●		2 x 88-gal or 75-gal fuel tank, 2 x 500lb bomb, 4 x 60lb RP
			○		○	○		○							●	●	●		4 x 500lb bomb
					○	○								●	●	●	●		2 x 1000lb bomb
○					○	○					○						●	●	4 x 88-gal or 75-gal fuel tank
			□		○	○		□								●	●		2 x 88-gal or 75-gal fuel tank, 2x AIM-9A/B
○					●	○					○						●		3 x 88-gal or 75-gal fuel tank, 1x Ekco 38B radar pod

## Hawker Sea Hawk colours and markings

The colour finishes worn by the Sea Hawk in service with the four Navies were quite simple and were based on schemes adopted by the Fleet Air Arm. Except the first prototype, which was left unpainted (thus having the colour of bare metal), the subsequent prototypes and other production aircraft were camouflaged according to Pattern No.2 issued by the Ministry of Aircraft Production for FAA fighters. The scheme prescribed the upper surfaces to be Extra Dark Sea Grey (often referred to as Dark Sea Grey) and the lower surfaces to be painted in Sky. The demarcation line between the two was one third down the depth of the fuselage. From 1 June, 1954 it was ordered to paint 6 inches of the undersurface, back from the leading edge of both wings and tailplane, the same colour as the upper surface. This change is evident on later production machines, which had their engine air intakes painted entirely in dark grey. A major change came about in 1959/60, when the fighters were ordered to have their camouflage consisting of Extra Dark Sea Grey on upper surfaces and white on undersurfaces with the demarcation in the centre line of the fuselage. The upper surface colour also covered up the sides of the vertical tail surfaces in contrast to the former scheme. Both camouflage schemes had a gloss finish, which reduced drag, improved the high performance characteristics required and added to the durability of the paints.

The 1:2:3 proportioned Type D roundels of 36" diameter, authorised in AMO A.413/47 from 15 May, 1947 were carried in six positions and no fin flash was applied. Bright identification colours to BS 381C standard were used. The only exception was the first prototype, which carried the dull war-time Type C (upper wings 48", lower 36") and C1 (fuselage 36") roundels and a 24" x 24" fin flash.

The serial numbers, in black, were displayed under the wings and at the rear of the fuselage. The former, 24" high, were applied in opposite ways of reading on each wing, while the latter were accompanied by the words ROYAL NAVY (both 4"). The wording was later increased to 8" and applied during 1954-56. Aircraft identification consisted of three-digit numbers (18" high) and carrier/shore station codes (8" or 16") painted either in black or white. The side numbers were placed on the fuselage, aft of the roundel (early style) or on the nose, and the code on the fin. Individual numbers repeated on the nosewheel cover, reading either vertically or horizontally and often only in the form of the last two digits. Unit crests or emblems were frequently carried on both sides of the fuselage nose, as well as the rank and crew member names along the top of the port side (rarely on both sides) of the cockpit. Aircraft which took part in the Suez campaign wore black and yellow invasion stripes around their rear fuselage and wings, and sometimes obliterating the serials below the wings. Many aircraft also had red or black fins and fin bullets and black/white or black/yellow "striped" arrester hooks. The 'Red Devils' aerobatic team used aeroplanes painted entirely in red gloss for their displays, while the experimental FRU machines were black all over; lettering on both colours was in white.

Indian Navy Sea Hawks wore the later FAA camouflage scheme of EDGS/White with Indian roundels substituting the original British national insignia. Serial and code positioning was applied in British style, although the height of the fin code 'W' increased to about 20".

Dutch aircraft colours were also similar to those of the FAA, retaining the original Pattern No.2 scheme, with a post-June 1954 amendment and a glossy finish. A four-colour roundel was carried in six positions (24" diameter on fuselage, 36" on wings) with a flag-type flash on the fin. The identification numbers, introduced back in 1946, were presented on the rear fuselage with the first number ('6' for Fighter) separated by the roundel from the two-digit individual aircraft number ('50' to '71' allocated); their height was the same as that of the roundel. The individual number was repeated on both sides of the nose (12" high) and on the nosewheel door as well. The word KON.MARINE, in black 6" high letters, appeared just below the fin bullet. From 21 August, 1959 the markings were revised to conform with American practice, the roundel only being applied to the upper port and lower starboard wings, and to the rear fuselage; the fin flash was deleted. All roundels had an equal diameter of 750 mm and those on the wings were placed further inwards (2,100 mm from the wing tips) compared to the previous scheme. The aircraft registration numbers ('111' to '131') were painted on the nose (400 mm high, black) and on the upper starboard and lower port wings (750 mm, white above and black below the wing). The last two digits of the number appeared on the nosewheel door, reading horizontally. The type designation ('FGA-50'), the complete individual number and 'KON.MARINE' were painted in black below the tailplane (the height was 100, 100 and 240 mm respectively). The carrier/shore base code ('D' or 'V' in black) was situated on the fin and was 500 mm high. The squadron badge was painted on both sides below the cockpit canopy. Arrow-style red markings also appeared on the tips of the nose and fin bullet, and red warning stripes were painted around the air intakes.

The colour scheme of Federal German Navy aircraft did not differ from the early FAA pattern of EDGS and Sky colours. The black and white crosses, of equal dimensions, were carried in six positions on the fuselage, above and below the wings. They were complemented by a black, red and yellow rectangular fin flash. The code/serial system in use from 1955 ordered for Sea Hawks to be identified by two letters (role and unit) and three numbers (first digit for squadron or flight, the rest for individual a/c). The code was displayed on the rear fuselage on either side of the national insignia and with the letters ('VA', 'VB' and 'RB' used) always to the left and the numbers to the right (approx 430 mm high, black). A black encircled anchor denoting the Service was placed below the windscreen. The aircraft type and construction numbers were painted in 1" black figures just below the national flag on the fin (e.g. HAWKER SEAHAWK 6691).

All the Sea Hawks had two narrow black vertical stripes which marked the position of boarding steps on the port side and warning triangles below the cockpit canopy (both sides, different style and text on Dutch and German a/c). Other markings were in yellow (on hood frame) and various stencils were applied in black.

The cockpit interior, pilot's seat and instrument panel shroud were painted in black. Undercarriage legs were white or silver while wheel disks were painted in aluminium. The undercarriage wheel wells and inner sides of their doors were painted in Sky, but later in service may have been repainted in white, light grey or aluminium. The engine air intakes were Sky or dark grey depending on the colour scheme adopted. Some machines had the surface around the cannon muzzles painted in black. The drop tanks and pylons were Sky, while the radar pod tip and the fuselage radome of the Mk.100/101 aircraft were matt black. ■



ISBN 80-902559-3-0



9 788090 255937

